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MR & MRS NEWMAN
PROPOSED DWELLING
WINDY RIDGE, BOULDNOR ROAD,
YARMOUTH, ISLE OF WIGHT, PO41 0UP

FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY

MAY 2023

the journey is the reward

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Mr & Mrs Newman

Proposed Dwelling

Windy Ridge, Bouldnor Road, Yarmouth, Isle of Wight, PO41 0UP

Flood Risk Assessment & Drainage Strategy

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1 Development Description and Location

Introduction

1.1 This Flood Risk Assessment has been undertaken in accordance with paragraphs 167 to 169 of the National Planning Policy Framework (NPPF) revised July 2021 (**Ref. 1**) and the associated Planning Practice Guidance, entitled Flood Risk and Coastal Change, published online on the 6th March 2014. (**Ref. 2**). As past guidance retains key elements from "Planning Policy Statement 25: Development and Flood Risk (PPS 25)" (**Ref. 3**) published by Communities and Local Government in December 2006 it may also be referenced where appropriate. This is of particular significance as the Environment Agency's published guidance in relation to flood risk consideration previously referenced this document despite the introduction of the NPPF. 'Development and Flood Risk: A Practice Guide Companion to PPS25' (**Ref. 4**) published by the Department for Communities and Local Government in February 2007, is also referenced, as is the Isle of Wight Council's Strategic Flood Risk Assessment Mk 2 June 2010 produced by Entec Consultants **(Ref 5)** and, to a lesser extent, the Preliminary Flood Risk Assessment produced by Amec on behalf of the Isle of Wight Council and dated November 2011 **(Ref 6)**. Policy DM14 Flood Risk of the Core Strategy Island Plan adopted March 2012 **(Ref 7)** (which also references PPS 25) is also considered and finally, in its draft form, the emerging Island Planning Strategy Development plan, published for consultation July 2021; specifically, section EV 14, Managing Flood Risk in New Development **(Ref 8)**.

1.2 This Flood Risk Assessment considers both whether the proposed development is appropriate in planning terms and the impact of the proposal on the local hydraulic regime, in accordance with, inter alia, the above referenced documents. The conditions currently existing in the area of the site are described, together with the methods used to identify and assess potential impacts from the proposals. The mitigation measures proposed to avoid or reduce the impacts, if necessary, are identified including the strategy for the drainage of both foul and surface water flows arising from the site.

1.3 The following questions/headings are based on the site specific flood risk Assessment checklist located on the National Planning Practice Guidance webpage (https://www.gov.uk/guidance/flood-risk-and-coastal-change#Site-Specific-Flood-Risk-Assessment-checklist-section) The headings have been rearranged and amended to allow the best presentation of the document and reflect previous guidance referred to in other local documents. As this document serves as both a Site-Specific Flood Risk Assessment and a Drainage Strategy, the document also includes expansion and

additions to these main points, where necessary, to provide further insight into the drainage strategy for the site.

1a - What type of development is proposed and where will it be located?

1.4 It is proposed to develop an area of land on the coast to the East of Yarmouth. The site is in the side garden of the curtilage of a property called Windy Ridge, off Bouldnor Road. The proposal is for a single residential dwelling. Access to the site will also be via Bouldnor Road.

1.5 As shown in **Figure 1.1** below, the development site is located West of the junction of Thorley Road and Bouldnor / Tennyson Road.

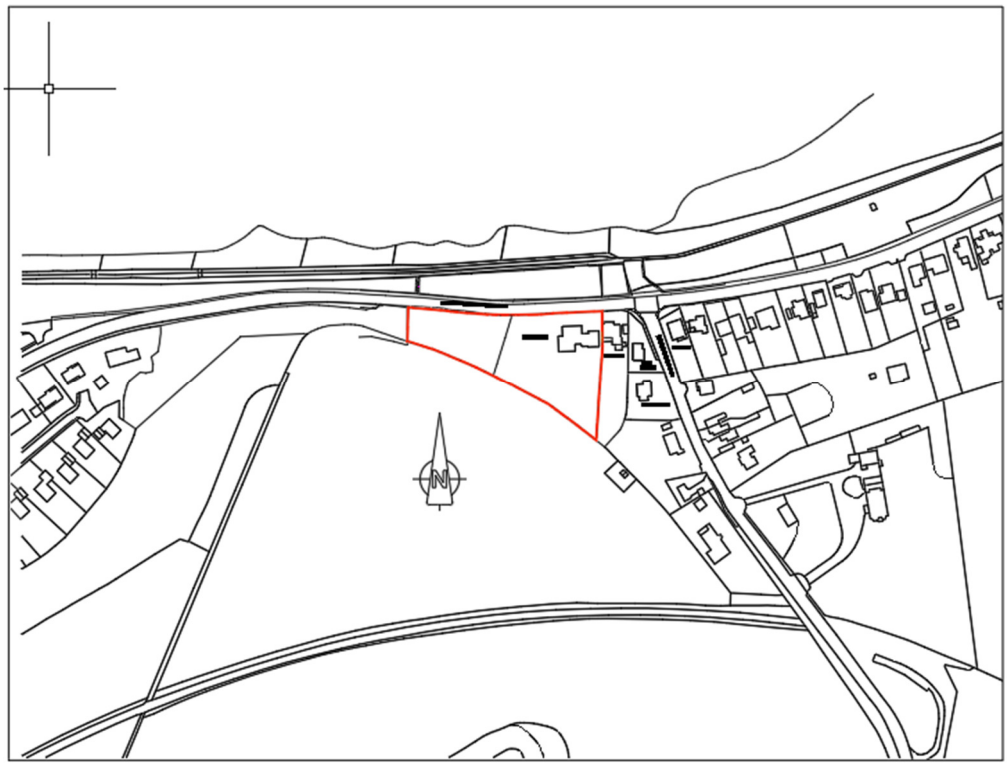

Figure 1.1. Location Plan

1.6 The area of the site is approximately 0.135 Ha.

1.7 Existing levels for the site range from approximately 1.98 mAOD in the south-eastern corner, to the highest level of around 7.7 mAOD on its roadside boundary with the A3054.

1b - What is the vulnerability classification?

1.8 The proposed development is of a residential nature. The flood risk vulnerability classification of a residential development proposal, according to Table 2 of the Technical Guidance of the NPPF, is 'More Vulnerable'. More Vulnerable developments are appropriate for Flood Zones 1 and 2 but should only be permitted in Flood Zone 3 if

the Exception Test is passed according to Table 3, 'Flood Risk Vulnerability Classification'.

1c – Is the proposed development consistent with the Local Framework Documents?

1.9 The proposed development is consistent with the objectives of the Island Plan Core Strategy document. Further insight in this regard can be found within the Design, Access and Planning Statement produced by the Andrew White Planning Consultancy, Planning Consultants for this proposal.

1.10 Locally, Planning Policy DM14 relating to Flood Risk, taken from the Island Plan: Core Strategy (March 2012) reads as follows:

"The Council will expect development proposals to reduce the overall and local risk of flooding on the Island. Development proposals will be expected to:

1. Demonstrably meet the aims and objectives of the Council's Strategic Flood Risk Assessment. When undertaking FRAs in Flood Zones 2 and 3, an allowance for climate change has to be provided. PPS25 requires this allowance to be a minimum of 100 years.

2. Provide appropriate on-site sustainable draining systems (SuDS) for the disposal of surface water in order to ensure there is no net loss of flood storage capacity or impact on water quality. This will need to meet national and local standards for SuDS to a sufficient level so as to gain approval by the SuDS Approving Body.

3. In addition to national requirements for a Flood Risk Assessment, planning applications for all new developments on sites over 0.25 hectares in Flood Zone 1 should be accompanied by a Drainage Strategy.

4. Where a proposal is in an identified Flood Risk Area, as defined by the Council under its responsibilities as a Lead Local Flood Authority, the Council will expect it to support the objectives and measures of the relevant flood risk management plans and strategy.

SuDS should be sensitively designed and located to promote biodiversity, enhanced landscape and good quality spaces that improve public amenities in the area. Proposed SuDS schemes should demonstrate consideration of the contribution they can make to the Island's Green Infrastructure Strategy. The contribution made to the GI network should be proportionate to the scheme proposal and any wider environmental mitigation requirements the proposed development associated with the SuDS scheme requires.

On greenfield sites, SuDS will be required to achieve no increase in the relevant net runoff rate to that prior to development. All other sites should aim to achieve a reduction from the existing run-off rate but must at least result in no net additional increase in run off rates. All developments will be expected to maintain and improve (wherever possible)

river and groundwater quality. For specific locations around the Island, a Flood Risk and Vulnerable Coastal Communities SPD will be developed which will address the specific flood risk related issues that will need to be considered by development proposals within areas covered by the SPD. The SPD will outline what measures will need to be demonstrated so that new developments would not be at risk of flooding as a result of climate change, or would not worsen flood risk elsewhere."

1.11 Nationally, in respect of flood risk consideration of development proposals paragraphs 167 to 169 of the NPPF state that:

"When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;

b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;

c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;

d) any residual risk can be safely managed; and

e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

Applications for some minor development and changes of use should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments set out in footnote 55.

Major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should:

a) take account of advice from the lead local flood authority;

b) have appropriate proposed minimum operational standards;

c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and

d) where possible, provide multifunctional benefits."

1d - Please provide evidence that the Sequential Test or Exception Test has been applied in the selection of this development type.

1.12 The risk-based Sequential Test should be typically applied at all stages of planning. Its aim is to steer new development to areas at the lowest risk of flooding, i.e., Flood Zone 1. Strategic Flood Risk Assessments (SFRA) provide the basis of applying the Sequential Test, at the time of the production of that document this was on the basis of the Zones in Table D.1 of PPS 25. Table 1: Flood Zones of the NPPF Technical Guidance then provided this information, which is now available online as part of the planning practice guidance for flood risk and coastal change available at www.gov.uk. It should be noted that, generally, the requirement or otherwise for the application of these tests is based on present day flood zones, more commonly known as the EA`s Flood Zones for Planning.

1.13 A local SFRA document was prepared by Entec Consultants in November 2007, with an update in June 2010, on behalf of the Council. Separate appendices were produced specifically analysing the flood risk considerations of each area of the Island. The mapping in Appendix F – Yarmouth, considered this area of the Island. Unfortunately, the mapping within that document does not extend far enough east to encompass this site. However, the flood extents associated with this area are shown on the Isle of Wight Council's online Core Strategy Proposal Map. Please see **Figure 1.3** below for an extract from that online resource, depicting the extent of the climate change adjusted Zone 2/3 flood zone as it relates to the site. It should be noted that the SFRA extents are the lighter blue zones, they have been adjusted to include the consideration of the impacts of climate change. The darker solid extents represent present day Flood Zone 3 extents.

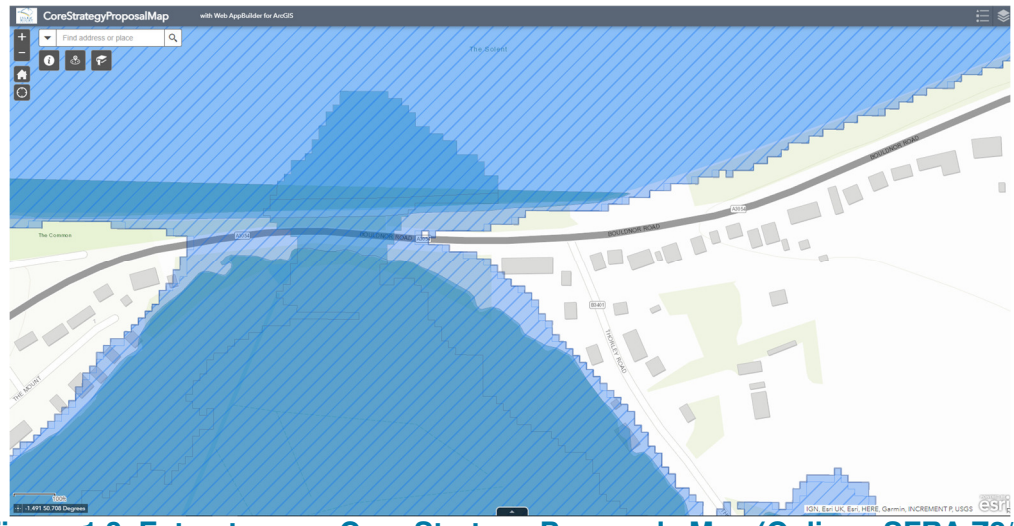

Figure 1.3. Extract map – Core Strategy Proposals Map (Online - SFRA Z2/3).

1.14 In Figure 1.4 below we have provided an extract from the Flood Risk Mapping provided by the Environment Agency, following our request for Product 4 information. Note how the present-day zone correlates with that shown in the larger scale mapping in Figure 1.3.

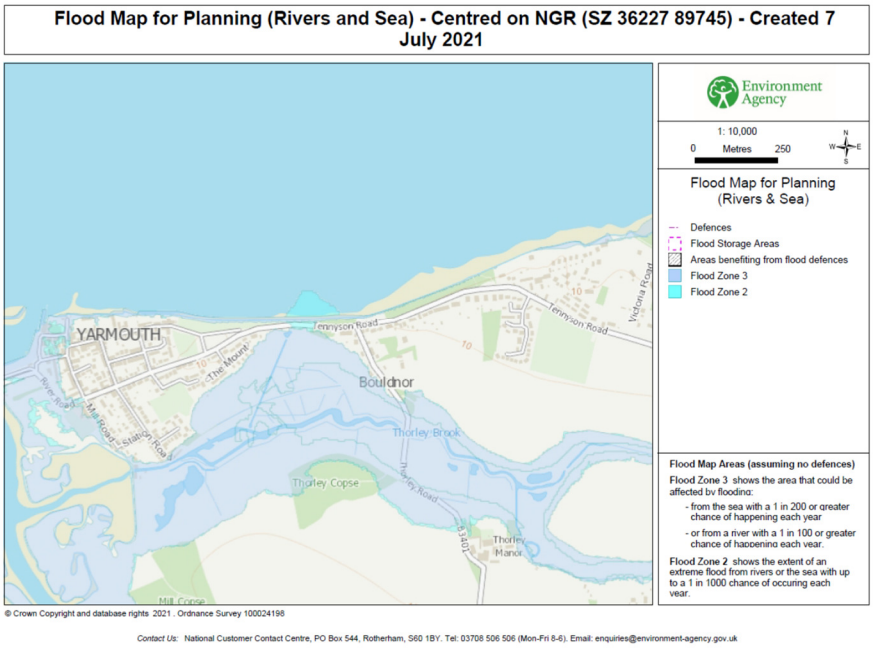

Figure 1.4. Extract from EA Flood Zones for Planning – Core Strategy Proposals Map (Online – EA Zone 3).

1.15 Both these maps clearly show that, in the present day, Flood Zone 3 does not intersect the position of the proposed dwelling. Whilst it intersects what will be the garden area of the proposed dwelling, that area of land already has a residential use by virtue of it currently being the side and rear garden for Windy Ridge.

1.16 If the Local Planning Authority were to consider the requirement for a sequential test against climate change adjusted extents, then those zones – in plan view at least – would intersect the position of the proposed dwelling. However, the Product 4 JFlow level data that the Environment Agency provided, included levels associated with the mapping, to demonstrate the position of those levels, for present day risks at the site. The JFlow data is included in Section 4 of this report.

1.17 In terms of tidal influence upon the site, it is in relatively close proximity to The Solent. Cell 6 of Appendix B of the Council SFRA - Tidal Climate Change Predictions, states that climate change adjusted tide heights in this area are 3.8 mAOD for Flood Zone 2 and 3.6 mAOD for Flood Zone 3.

1.18 The Environment Agency has recently introduced revised climate change allowances that assess climate change to the year 2125 rather than 2115, as in the Council`s SFRA Mk 2. Using tide height information from another site in Yarmouth and the Product 4 information provided by the EA, we have calculated the flood heights in 2125. These calculations are clearly laid out in Section 4 and reveal a maximum flooded tide height of 3.697 mAOD and a river height of between 1.09 -1.74 mAOD, for 2125.

1.19 The Environment Agency recommend that engineers conclude an appropriate freeboard allowance to add, to allow for discrepancies in the modelling and calculation process. In this instance, considering the More Vulnerable use proposed, we have decided to use the maximum 600mm freeboard allowance. This gives a minimum acceptable finished floor level of 4.297 mAOD.

1.20 The lowest level of this dwelling, the lower ground floor, is set at 4.400 mAOD. This means that there is a 703mm freeboard allowance above the maximum 2125 climate change allowance adjusted flood levels. Looking at this in more detail, as shown in the topographical survey for the site (produced by Williams Land Surveying, to Ordnance Survey grid and height, and submitted with this application) the road on the northern side of the site is between 7.8 mAOD and 6.8 mAOD high. Effectively, even though it lowers to around 4.8 mAOD some distance to the west, this forms a very effective, 100-year floodproof sea defence against the 3.697 mAOD climate change adjusted 2125 tide heights.

1.21 If we then consider that the maximum river height is 1.74 mAOD (again, see calculations in Section 4), against the minimum finished floor height of 4.4 mAOD, this provides a 2660 mm freeboard allowance against fluvial/river flood threats. It is interesting to note the substantial difference in height between EA tidal and fluvial flood level data. We believe this to be an anomaly created by the separate modelling processes, greater influence of climate change on the sea and the level data used in the modelling process.

1.22 We have considered the flood zone mapping information, relevant policies and guidance, EA flood level data, topographical survey, new climate change allowances and other information. We have concluded that, despite the mapping showing that the general area of the site where the dwelling will be located is partially intersected by the climate change adjusted flood zone, vertically, the proposed dwelling cannot be considered to be within the flood zone or at any threat of flood risk from either tidal or fluvial sources. As such, we consider that, in applying the broad principles of the sequential test process – i.e., that development should be located appropriately and safely in terms of flood risk – this proposal is effectively located within Flood Zone 1 and so does not require the formal

Sequential Test process. It also follows that, if common sense is applied, on the same basis, a Flood Warning & Evacuation Plan (FWEP) is not required.

1.23 Irrespective of the sequential testing it is evident that the site would pass the Exception Test, if required. Paragraph 163 onwards, of the National Planning Policy Framework indicates:

1.24 *"163. If it is not possible for development to be located in areas with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the site and of the development proposed, in line with the Flood Risk Vulnerability Classification set out in Annex 3.*

164. The application of the exception test should be informed by a strategic or site specific flood risk assessment, depending on whether it is being applied during plan production or at the application stage. To pass the exception test it should be demonstrated that:

a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and

b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

165. Both elements of the exception test should be satisfied for development to be allocated or permitted.

166. Where planning applications come forward on sites allocated in the development plan through the sequential test, applicants need not apply the sequential test again. However, the exception test may need to be reapplied if relevant aspects of the proposal had not been considered when the test was applied at the plan- making stage, or if more recent information about existing or potential flood risk should be taken into account.

167. When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;

b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;

c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;

d) any residual risk can be safely managed; and

e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

168. Applications for some minor development and changes of use should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments set out in footnote 55."

1.25 The development will provide wider sustainability benefits to the community that outweighs the limited residual flood risk, for the following reasons:

- Creation of short-term employment opportunities during the construction phase of the development;
- Provision of a residential dwelling within the heart of a sustainable community;
- Provides a contextual redevelopment that enhances the local area.
- Provides redevelopment of an otherwise underutilised piece of developable land and places less stress on allocating housing on the development boundaries.

1.26 This Flood Risk Assessment will demonstrate that the proposed development is safe.

1.27 In the interests of clarity, PPS 25 and its practice guide for the Sequential and Exception Tests, to which the LPA often refer in their pre application advice on this matter, previously referred to the Exception Test including consideration of "previously developed, developable land". Brownfield land was previously defined in Planning Policy Statement 3 (PPS3) (Ref 7) in 2010 as land "…which is or was occupied by a permanent structure, including the curtilage of the developed land and any associated fixed surface infrastructure." This site could be considered a Brownfield site in accordance with this definition. However, the NPPF withdraws this requirement of the test and as such, considering the following observations, the proposed development satisfies the Exception Test.

1.28 To reiterate, neither the EA or SFRA flood extent passes over the vehicular access to the site, so a dry means of escape is available, to the east, at all times – even during a flood event. As such, we consider it unlikely that it would impact upon the ability of occupiers to enter and leave the site during a flood event. Moreover, the residential

accommodation at the site is positioned well above the SFRA's or EA's 100-year climate change adjusted flood extent, as evidenced above and in Section 4, so occupiers could stay in the property in complete safety in the unlikely event of access being impeded. This further underlines that a FWEP should not be required.

1.29 Regardless of the requirement or otherwise for Sequential and Exception testing this Flood Risk Assessment will demonstrate that the proposed development is safe.

2 Definition of a Flood Hazard

2a - What sources of flooding could affect the site?

Potential source of flooding	Yes / No
Fluvial flooding	Yes
Tidal flooding	Yes
Groundwater flooding	Yes
Overland flow flooding	Yes
Failure of the urban drainage system	Yes
Failure of local infrastructure	Yes

2a - For each identified source, describe how flooding would occur, with reference to any historic records wherever these are available

2.1 In terms of tidal influence upon the site, it is in relatively close proximity to The Solent. However, Cell 6 of Appendix B of the Council SFRA - Tidal Climate Change Predictions, states that climate adjusted tide heights in this area are 3.8 mAOD for Flood Zone 2 and 3.6 mAOD for Flood Zone 3.

2.2 The Environment Agency have recently introduced revised guidance in terms of climate change allowances. This work references a design year of 2125 for the consideration of the lifetime of a residential development, generally considered to be 100 years. This is considered fully in Section 4 of this document. However, this revised guidance gives a calculated 2125 climate change adjusted Flood Zone 3 tide height of 3.697 mAOD.

2.3 Fluvial flooding risks to the site would be from Thorley Brook, on the southern side of the site. Whilst this river and its tributaries are in relatively close proximity to the proposed development site, it is not so close that flood extents associated with this estuarine feature affect it directly. The threat arises indirectly from Rofford Marsh, which is an estuarine environment.

2.4 Flooding from groundwater could also be a source of flooding to the site, should the existing levels in the underlying groundwater table prove to be high. Severe storm events could cause groundwater levels to rise above ground level.

2.5 Overland flows could affect the development during times of severe storms, if design levels of the development do not consider overland flow paths of flood waters.

2.6 Local urban surface water drainage should be considered as every drainage system has a design capacity, which at some point can be exceeded. Severe storm events can cause the failure of the local urban drainage.

2.7 There is evidence of existing foul sewer network in the vicinity of the site. We believe that there is only a rising main within Bouldnor Road, but there is public foul sewerage infrastructure to the southeast, in Thorley Road.

2.8 As shown in the defences map, supplied by the EA, in Figure 2.1 below, there are various lengths of defence in the general area of the site. Due to the distance of each of these structures from the site, no specific infrastructure could be construed as specifically protecting the site from flood risk. The green length shown below is the defence forming the esplanade immediately adjacent to the coast. The large embankment that Bouldnor Road and the site sit atop is a more substantial defence than the one next to the coast, though not formally recognised. The channel of Thorley Stream is also shown to be protected by various lengths of defence, though this appears to mainly be the natural bank, rather than formally constructed defences.

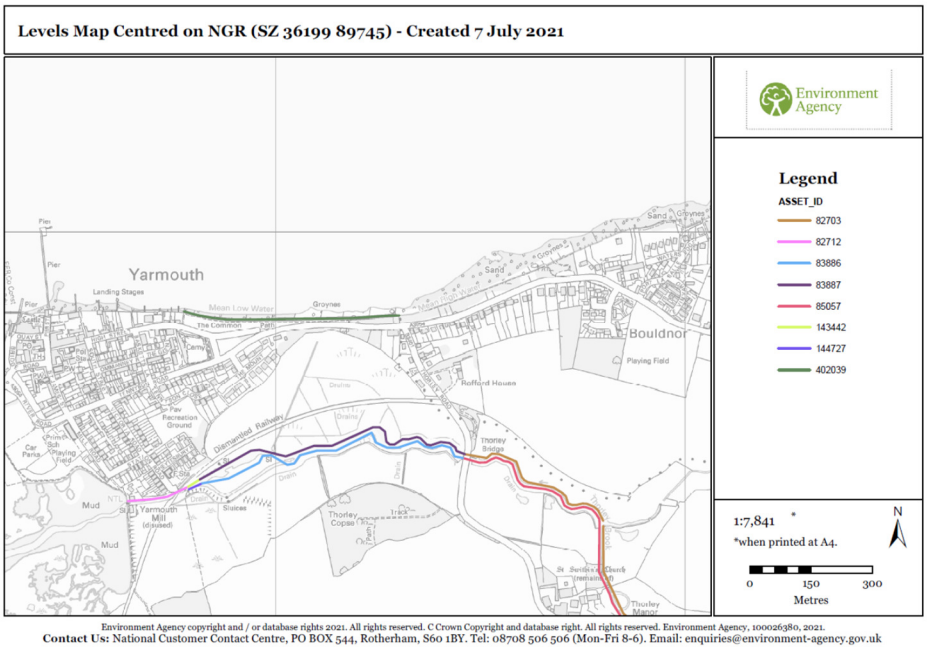

Figure 2.1. EA Defence Map.

2.9 In terms of historic records, our client states that no flooding has been experienced at the site during his ownership.

2a - What are the existing surface drainage arrangements for the site?

2.10 The site has various small areas of hardstanding but is predominantly permeable. As such there is no formal piped surface water drainage network specifically draining the site of the proposed dwelling – though there is existing drainage for the host property, Windy Ridge. We have undertaken a QBar analysis (mean annual flood event) for the application site, of approximately 0.135 ha in area, using Microdrainage (drainage software), which suggests a Greenfield run off rate of 0.7 l/s. A copy of the QBAR calculation accompanies this submission.

3 Probability

3a – Which flood zone is the site within?

3.1 The proposed development site is located partially within Flood Zone 1, 2 & 3a of the Environment Agency (EA) Flood Zone Maps as available at https://flood-map-for-planning.service.gov.uk/.

3b– If there is a strategic Flood Risk Assessment covering the site what does it show?

3.2 As stated above, a Strategic Flood Risk Assessment was undertaken by Entec Consultants in November 2007 on behalf of the Isle of Wight Council and subsequently updated in June 2010. This document assesses the Island with regard to flood risk issues by providing an island wide view as well as separate appendices for each settlement identified as part of the spatial strategy for regeneration and growth through the Core Strategy.

3.3 The SFRA includes a number of appendices that consider flood risk in the main towns and areas of the Island. Appendix F considers Yarmouth. Unfortunately, the mapping and written consideration does not extend far enough east to specifically consider this site.

3.4 However, as stated above, Cell 6 of Appendix B of the Council SFRA – Tidal Climate Change Predictions, states that climate adjusted tide heights in this area are 3.8 mAOD for Flood Zone 2 and 3.6 mAOD for Flood Zone 3.

3c - What is the probability of the site flooding taking account of the contents of the SFRA and of any further site-specific Assessment?

3.5 The site, as a whole, is located (in plan view) within Flood Zone 1, Flood Zone 2 and Flood Zone 3a. Flood Zone 3a as described in Table 1 of the NPPF Technical Guidance, has a high probability of flooding and comprises 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. In this instance tidal risks are higher than fluvial, though neither are a direct threat to the site.

3.6 Flood Zone 2, as described in Table 1 of the NPPF Technical Guidance, has a medium probability of flooding and comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%) in any year.

3.7 Flood Zone 1 is shown to be at less than 0.1% chance of flooding in any year, this is sometimes known as having a 1:1000 year chance.

3.8 With no specific further analysis of the site available in the SFRA, we have referred instead to the online flood extents provided by the Isle of Wight Council (https://iwc.maps.arcgis.com/apps/webappviewer/index.html?id=7e7cfe1b75c3460e91320a9dbb7f5639), the 'Flood Map for Planning' provided by the Environment Agency (https://flood-map-for-planning.service.gov.uk) and the data provided by the EA. Looking at the EA data shown in Section 1, Figure 1.4, the EA flood extents DO NOT include consideration of the impacts of climate change. However, in Section 4 of this report we have included consideration of their new climate change allowances.

3.9 The SFRA modelled flood extents shown in Figure 1.3 DO include the consideration of the impact of climate change. Generally, for residential uses, a 100-year design life is appropriate. As such, the modelling work undertaken for the Council modelled the impacts of climate change, using 2115 as the modelled year. The new climate change allowances produced by the EA are intended to allow consideration to 2125.

3.10 In the absence of any specific analysis of the site or surrounding area in the SFRA, to allow the Local Planning Authority to easily consider the impacts of flooding on the site, specifically those arising from the sea, we have overlaid the SFRA climate change adjusted flood extent onto the development layout. See below:

Figure 3.1 SFRA Extents overlaid on development layout.

3.11 For clarity, the light blue area shows the EA Flood Zones for Planning, the dark blue is the SFRA climate change adjusted flood extent. Clearly this appears to intersect the developable area of the site, however, as we prove below, this is inaccurate and when a site-specific assessment is made of actual levels and climate change adjusted heights

of these flood extents, it is clear that vertically the site is out of the flood zone. This also means that the proposed dwelling, with a 4.4 mAOD lowest finished floor level, is substantially above the climate change adjusted highest tide height of 3.697 mAOD. Figure 3.2 below shows a self-explanatory cross section view of the layout of the various floors of the proposed dwellings. To give a further layer of safety, despite the lower ground floor being substantially above climate change adjusted flood heights, this floor will be predominantly used for storage / recreational / outdoor related uses, and certainly not for sleeping accommodation:

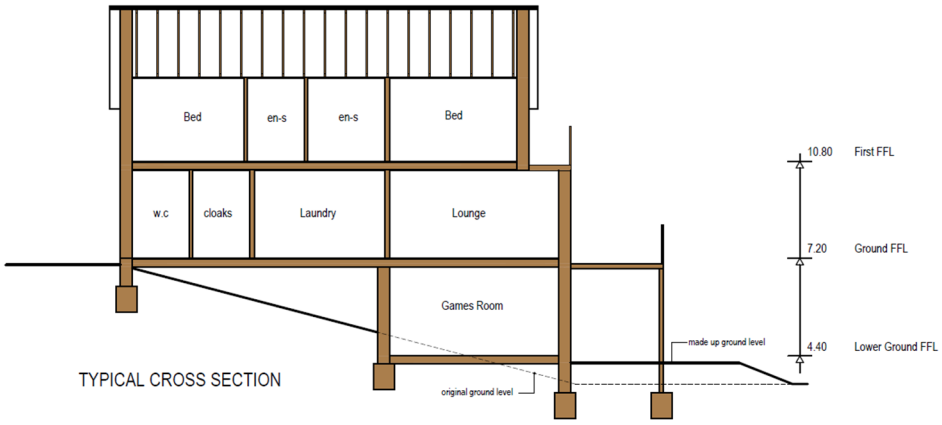

Figure 3.2 Section through proposed dwelling.

3.12 The EA generally recommend a freeboard allowance of between 300mm & 600mm. As such, all floors provide for a height in excess of the 600mm allowance. A new research document, ('Accounting for Residual Uncertainty; an update to the fluvial freeboard guide') replacing the previous W187 guidance, and first started in 2017, relating to the consideration of freeboard allowance design, has been published. The current advice on the use of this guide is that, 'Developers should submit flood risk assessments to EA in accordance with local advice until advised to do otherwise.' This is the position as of 24 February 2021.

3.13 Local guidance is provided in the form of the aforementioned SFRA Mk 2. The SFRA refers to using either the standard 300mm or 600mm and to consult the EA. We have considered the advice of the EA, and our experience at other sites, and have used the maximum freeboard allowance for each floor of this More Vulnerable use.

3.14 As such, in terms of tidal impacts we do not consider that the constructed development or site would be under any threat from present day or climate change adjusted flooding. In the very unlikely event that the sea defence and road embankment were breached

further west and these flows somehow inundated the site, a clear and dry (even during a climate change adjusted flood event) escape route is available.

3.15 With the above in mind in terms of tidal impacts, we can now consider the impact of other potential sources of flooding to the site. Based on the EA and SFRA flood extents, a fluvial flood risk to the site may exist from Thorley Brook and the surrounding marsh land. However, as summarised above, and considered in detail in Section 4, we do not consider there to be any risks from fluvial flooding, in either the present day or climate change adjusted scenarios. The maximum fluvial flood height, using the EA`s revised climate change allowances, is between 1.09 & 1.74 mAOD. With a 600mm freeboard allowance applied, as described above, the maximum 2125 modelled height of 2.34 mAOD is far below the lowest floor level for the proposed dwelling (4.4mAOD). As such, we consider there to be no substantial risks from fluvial sources.

3.16 In terms of groundwater flooding, the bedrock geology beneath the site is the Bembridge Marl Formation. These are composed of varying quantities of clays, loams, sand and shales. As such, the level of permeability is highly variable. Clays/shales in the Marls are generally of limited permeability and as such may be unsuitable for a concentrated discharge of surface water via infiltration. However, dependent upon type, whilst loams retain water, they will allow excess water to drain away. They are not generally so impermeable as to cause specific issues with groundwater flooding.

3.17 It is also worthy of note that the IOW SFRA states (Section 3.3, page 22) that :

"Groundwater flooding on the Isle of Wight is not considered by the Environment Agency as a significant issue".

3.18 Surface water flooding has been linked to some of the flooded properties during the 2000 floods on the Island. A recurring theme has been drains not being able to discharge because of raised river levels and thus the capacity of the drains was soon exceeded resulting in surface water flooding. The localised and site-specific nature of these flooding incidents does not lend them to being assessed at the strategic level and they were not included within the SFRA.

3.19 The current levels across the site ensure that during severe storm events, flooding from a failure in the local urban drainage system or from overland flow flooding is unlikely to occur.

3.20 Similar is true in terms of local infrastructure, as stated above, whilst there are specific defences, due to the elevation and position of the site, they could not reasonably be considered to be directly protecting the site.

3.21 Having considered all the flood risks associated with the proposed use of the site it is considered that, for each potential source of flooding identified in Section 2a, the probability of flood risk is as follows:

Probability of flooding	Low / Medium / High
Fluvial flooding	Low
Tidal flooding	Low
Groundwater flooding	Low
Overland flow flooding	Low
Failure of the urban drainage system	Low
Failure of local infrastructure	Low

3.22 Whilst we appreciate the site is considered to be within the SFRA flood extents when considered in plan view, a detailed analysis of the site levels, revised climate change allowances and currently available data has led to our conclusion that the threat of flooding to the site is low. The general level of the site and the design of the proposed dwelling limit any direct undue threat to life from flood impacts, other than those usually found in Flood Zone 1. This exercise further underlines our stance that neither sequential testing, nor a FWEP, is required.

3d - What are the existing rates and volumes of run-off generated from the site?

3.23 As stated above, the site is currently predominantly permeable, due to the gravel drive and turning area. A garage structure is the only impermeable surface within the site – which simply drains via infiltration, shedding direct to the adjacent land. As such, there is no formal piped surface water drainage network, though the host property, Windy Ridge, drains roof water to the marshes.

3.24 To clarify this, as stated above, we have undertaken a QBar calculation to establish the existing runoff rates. This reveals a QBar Rural value of 0.7 l/s. We have not included the existing garage structure within this calculation (QBar Urban).

3.25 We consider that, as is usually the case, the precise details of a surface water drainage scheme can be covered by the imposition of an appropriately worded condition. This would include a 40% allowance for climate change.

4 Climate Change

4a - How is flood risk at the site likely to be affected by climate change?

4.1 The detrimental effect of climate change in terms of pluvial considerations is taken into account within PPS 25 with a 20% increase in rainfall intensity. The NPPF Technical Guidance (In Table 5, page 11) uses an additional 30% increase for rainfall between 2085 and 2115, as does the EA. This rate is now set at 40%.

4.2 As previously stated, the impacts of climate change have been considered via the following calculations, undertaken using the EA`s revised climate change allowances. Looking first at tidal considerations, using experience garnered from other sites, the EA appear to prefer that we consider present day data and use upper end allowances from their online guidance. As this site is not within the tidal EA Flood Maps for Planning Flood Zone 2 or 3, when we requested Product 4 data, it did not include tide heights. However, the EA supplied us with Product 4 tide level data at another site in the west of Yarmouth. We can see no reason that this data should not be applicable slightly further east along the same stretch of coast, so have used these present-day figures to base our calculations on. The data supplied is as shown below:

Chainage point: 147	Easting: 433490.993	Northing: 90770.8963

Year	Tide Level (mAOD*)	
	0.5% annual exceedance probability/1 in 200 Year (Flood Zone 3)	0.1% annual exceedance probability/1 in 1000 Year (Flood Zone 2)
2015	2.2	2.4
2070	2.8	2.9
2115	3.4	3.5

* Levels in metres above Ordnance Datum Newlyn.

Figure 4.1 EA Present Day Tide Level Data.

4.3 In this instance, we are most directly concerned with the risks associated with the 1 in 200 year / Flood Zone 3, so the closest data we have to the present day and the site, from a location on the western side of Yarmouth, at Fort Victoria, is the 2.2 mAOD 2015 Tide Level. The first step is to apply the climate change allowances dictated by the EA, to the 2015 data, to adjust it to the current epoch. The EA have previously stated that we should apply the Upper End allowance for climate change allowances in the Southeast, which is shown below:

Area of England	Allowance	2000 to 2035 (mm)	2036 to 2065 (mm)	2066 to 2095 (mm)	2096 to 2125 (mm)	Cumulative rise 2000 to 2125 (metres)
South east	Upper end	6.9 (242)	11.3 (339)	15.8 (474)	18.2 (546)	1.60

Figure 4.2 Upper End Tide Allowance – South East.

4.4 So, to calculate the climate change adjusted flood level to 2035 (the end of the first epoch), we multiply the time difference between 2015 and 2035, 20 years, by the forecast yearly rise in sea levels for the 2000 to 2035 epoch, so: 20 x 6.9mm = 138mm. To get to the calculated tide height for 2125, we then need to add this figure and the intervening yearly totals (in brackets in the table above) together, to ascertain the adjusted tide height, using the climate allowances for the year 2125. So, 138 + 339 + 474 + 546 = 1497mm. This cumulative tide level rise figure for 2015 to 2125 then needs to be added to the 2015 tide level stated by the EA in the above table. 2200mm + 1497mm = 3697mm, or **3.697 mAOD**.

4.5 For clarity, 3.697 mAOD is the climate change adjusted tide level for 2125. Adding a 600mm freeboard, as discussed above (3.697 + 0.6m), gives a maximum tide height, including climate change and a freeboard allowance for a factor of safety, of **4.297 mAOD**.

4.6 Due to the site's position between the sea and Rofford Marsh / Thorley Brook, we also need to consider fluvial risks and the impacts of climate change upon them. During processing of a planning application for a new solar park in Wootton, we agreed a methodology for applying the new climate change allowances to present day fluvial water heights. However, this involved calculating the 1 in 100-year fluvial design flood level to 2080, due to the flood risk vulnerability classification of a such a development. So, we must make a slight alteration to this approach to calculate tide heights to 2125, allowing for a considered 100-year design life for a residential dwelling.

4.7 In order to do this, we considered the flood depth information (Product 4) supplied by the EA, and as shown below:

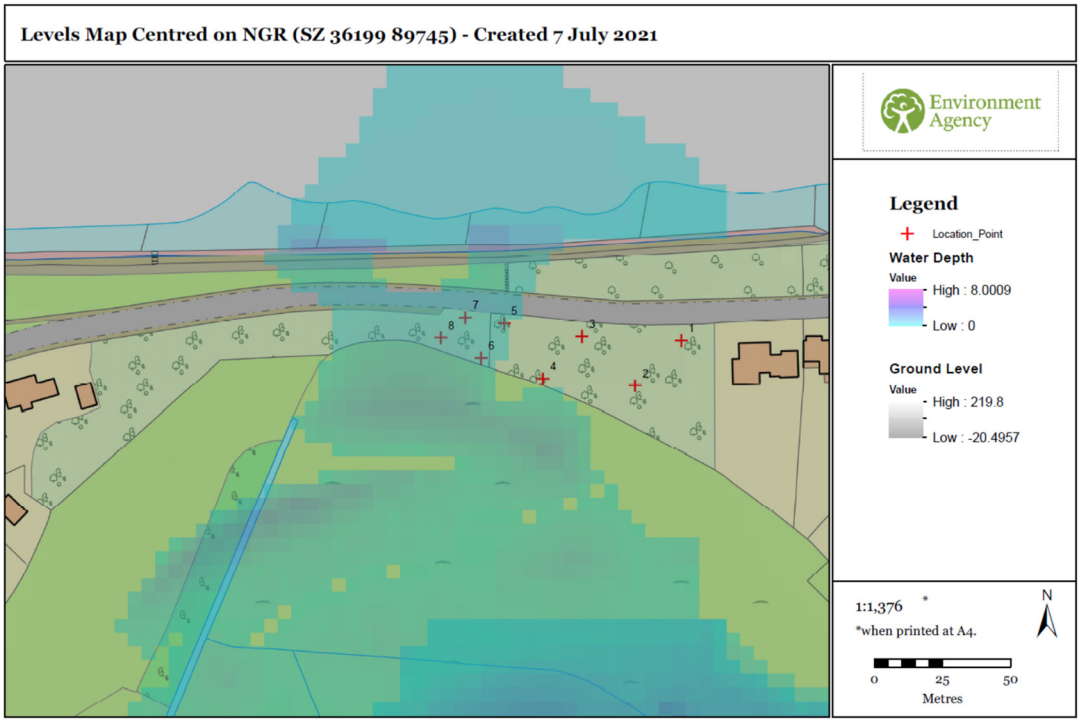

Figure 4.3 – EA Product 4 Levels Map

Water Depths & Levels for NGR (SZ 36199 89745)

	Water Surface Level (mAOD*)			Water Depth (metres)	
Point	0.5% Annual Probability/1 in 200 Year Present Day (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year Present Day (Flood Zone 2)	Ground Level	0.5% Annual Probability/1 in 200 Year Present Day (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year Present Day (Flood Zone 2)
1	No Data	No Data	1.19	No Data	No Data
2	No Data	No Data	0.78	No Data	No Data
3	No Data	No Data	0.49	No Data	No Data
4	No Data	No Data	0.35	No Data	No Data
5	No Data	0.34	0.33	No Data	0.01
6	No Data	0.33	0.28	No Data	0.05
7	No Data	0.33	0.30	No Data	0.03
8	No Data	0.34	0.26	No Data	0.08

* Levels in metres above Ordnance Datum Newlyn

Figure 4.4 EA Flood Water Depths & Levels.

4.8 As the precise position of the proposed dwelling is not within the present-day flood zone 3, the EA have understandably not provided any flood data for that area, which is encompassed by the empty data points 1-4, in the above table (Figure 4.4). From the remaining depths, to simplify matters somewhat to establish the methodology, we chose

the single worst case flood depth of 0.34 metres for Point 5, which is also the closest to the position of the proposed dwelling. Our calculation, and explanation, is as follows:

Step 1 – Calculate the annual climate change allowance between 2020 and 2080.

• 49% / 60 years = 0.008167 per year (0.8167%)

Step 2 – Calculate the (higher) allowance to be applied between 2008 to 2020 (12 years) (JBL Data was modelled in 2008)

• 0.008167 x 12 years = 0.098004 (10%)

Step 3 –We then calculate the 2020 flood level + climate change.

• Flood level at year 2020 = 0.34m x 1.10 = 0.374m

Step 4 – Identify 2080 climate change adjusted depth

• 0.374m x 1.49 = 0.55726m

Step 4a – Identify 2125 climate change adjusted depth

• 2080 to 2125 = 45 years. 45 x per year higher Allowance increase of 0.008167 = 0.367515 (37%). 0.55726 x 1.37 = 0.7634462

Step 5 – 2125 depth + ground level (Taken from Figure 4.4, ground level for Point 5)

• 0.33m + 0.7634462 = 1.09 m Above Ordnance Datum (AOD)

Step 6 – Add freeboard allowance (600mm)

• 1.09 + 0.6m = **1.7 mAOD**

4.9 The above calculation gives a maximum climate change adjusted river height of 1.7 mAOD and uses the 'Higher' allowance taken from the EA's online climate change allowance advice at https://environment.data.gov.uk/hydrology/climate-change-allowances/river-flow?mgmtcatid=3043. The table we referred to is the Isle of Wight Management Catchment peak river flow allowances, as shown below:

Isle of Wight Management Catchment peak river flow allowances

	Central	Higher	Upper
2020s	15%	22%	37%
2050s	17%	26%	51%
2080s	33%	49%	99%

Figure 4.5 IW Peak River Flow Allowances

4.10 We used the higher allowance from this table, as the EA suggested its use at the other site in Yarmouth, mentioned above. As we said, we need to consider a 100-year life for this development to 2125. The above table only gives percentages referenced to 2080; as such, we have adjusted that part of the calculation (Step 4a) to allow for this. Also, to counter any suggestion that we have not fully considered climate change impacts on fluvial risks, and/or have not been sufficiently conservative in our approach, we have also undertaken the calculation using the Upper allowance for 2080 of 99%, see calculation below:

Step 1 – Calculate the annual climate change allowance between 2020 and 2080.

• 99% / 60 years = 0.0165 per year (1.65%)

Step 2 – Calculate the (upper) allowance to be applied between 2008 to 2020 (12 years) (JBL Data was modelled in 2008)

• 0.0165 x 12 years = 0.198 (20%)

Step 3 –We then calculate the 2020 flood level + climate change.

• Flood level at year 2020 = 0.34m x 1.20 = 0.408m

Step 4 – Identify 2080 climate change adjusted depth

• 0.408m x 1.99 = 0.81192m

Step 4a – Identify 2125 climate change adjusted depth.

• 2080 to 2125 = 45 years. 45 x per year higher Upper increase of 0.0165 = 0.7425 (74%). 0.81192m x 1.74 = 1.4127408

Step 5 – 2125 depth + ground level (Taken from Figure 4.4, ground level for Point 5)

• 0.33m + 1.4127408 = 1.74 m Above Ordnance Datum (AOD)

Step 6 – Add freeboard allowance (600mm)

• 1.74 + 0.6m = **2.34 mAOD**

4.11 Therefore, as we have intimated in the preceding sections of this report, using an absolute worst-case scenario 2125 fluvial flood height of 1.74 mAOD we can conclude that there is no climate change adjusted flood risk associated with fluvial flows to a dwelling set at a minimum lower ground floor level of 4.4 mAOD.

4.12 As such, whilst the potential effects of climate change are acknowledged, due to its design, level and location their impact upon this proposal will be limited, even considering the revised climate change allowances published by the EA.

5 Detailed Development Proposals

5a Please provide details of the development layout, referring to the relevant drawings including foul and surface water drainage arrangements.

5.1 The development proposal is for the construction of a residential dwelling. The proposal includes parking & vehicle circulation areas, and boundary fencing.

5.2 Looking first at surface water disposal, as discussed above, the ground conditions in the area may not be favourable for drainage via infiltration. The Geology of Britain Viewer from the BGS website has been referred to which, as the name suggests, details drift/superficial deposits and underlying geology across Britain, including the Isle of Wight.

5.3 According to this map, geology beneath the site is the Bembridge Marl Formation. These are composed of varying quantities of clays, loams, sands and shales. As such, the level of permeability is highly variable. Clays/shales in the Marls are generally of limited permeability and as such may be unsuitable for a concentrated discharge of surface water via infiltration. However, dependent upon type, whilst loams retain water, they will allow excess water to drain away – so drainage over a large area, such as permeable paving, may work.

5.4 A plethora of guidance on the design and application of sustainable drainage systems (SUDS) has been published by the former DETR (now known as the DTLR), Environment Agency, Susdrain and other bodies. These all provide guidance on the design of various forms of sustainable drainage systems. The host property, Windy Ridge, currently drains surface water flows arising from its roof, suitably attenuated, to the marshes at its rear. It is intended to do similar for this new property.

5.5 Whilst full details of drainage systems are not required at planning stage, it is useful to examine broad principles. A formal piped drainage network will be designed to carry flows from the building's roof, with external hard surfaced areas likely left to drain via infiltration, particularly due to the existing gravel finish for the parking area for Windy Ridge working well. All this will be designed in accordance with relevant guidance including but not limited to the Design and Construction Code, BRE Digest 365 and Approved Document H from the Building Regulations suite of documents.

5.6 The required attenuation storage could be provided in a number of ways. A dry basin / pond would be most cost effective, though 'AquaCell' type crates, sub-base storage, swales and oversized pipes would all be suitable. We have undertaken a QSE study (Quick Storage Estimate), shown below:

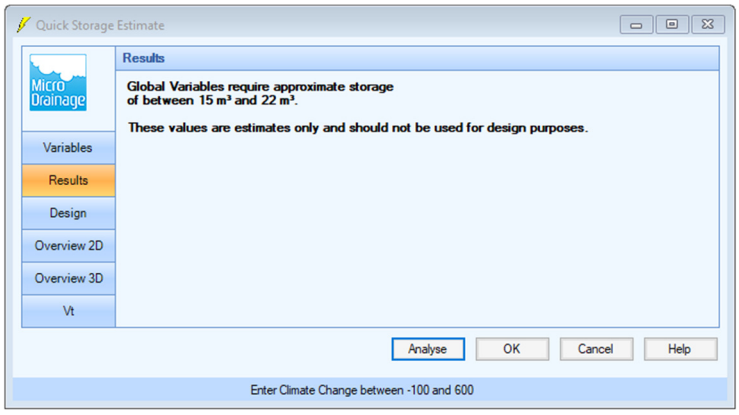

Figure 5.1 Attenuation Storage Estimate

5.7 The QSE is based upon the QBar analysis for the whole site (0.7 l/s) and a likely impermeable contributing area, comprising only the roof area, on the presumption that the parking and circulation area could be retained in its current permeable form. The required maximum 22m^3 of required attenuation storage would be easily accommodated within the site.

5.8 The flow rate from the site will be reduced to match the existing flow rate by use of various 'Hydrobrake' Flow Controls (or similar) in conjunction with appropriate attenuation storage. The use of such devices to restrict discharge rates is preferable over simple orifice plates as they allow the use of a larger aperture in normal low flow conditions. The design of the Hydrobrake uses back pressure from trapped air and the creation of a vortex at higher flow rates to restrict the cross-sectional area available for outfall. This larger orifice provides easier future maintenance as it is less prone to blocking amongst other benefits.

5.9 It is considered that the measures outlined above will create a SUDS and Building Regulations compliant surface water drainage design acceptably dealing with such flows. The attenuation will be designed to limit the surface water discharge from the site to the QBAR value. The QSE study allows for a 40% allowance for climate change. The submission of the details of the surface water drainage design can be controlled by a suitably worded planning condition.

5.10 In terms of foul drainage, we have used the advice contained with the Design and Construction Code to ascertain foul flows from this development. As shown below:

Design peak flow		= 4000 litres/day/dwelling
Litres/ second / dwelling		= 4000 / 24 / 3600
		= 0.0463
Total Proposed foul water flow rate for 1 dwellings		= 0.0463 x 1 = 0.0463
	Qfp	= 0.0463 l/s

5.11 Mayer Brown is aware that there is public sewer infrastructure in the vicinity of the site. In Bouldnor Road there is a rising main, and a gravity sewer system in Thorley Road. There is a pumping / transfer station on the western side of Thorley Road, approximately 125 metres from the site, as the crow flies, to the southeast. This facility transfers foul flows draining to the gravity system in the vicinity, to the larger pump station facility at the northern end of Halletts Shute. Via various pumping stations and rising mains, foul flows are sent to Sandown WWTW for treatment and disposal.

5.12 Where sewer capacity is an issue, it is the duty of the sewerage undertaker to provide a public sewer for domestic purposes. This was previously always via S98 of the Water Industry Act 1991. This Act allows developers to requisition a suitable sewer and/or upgrade existing infrastructure to drain a site.

5.13 With this in mind, to quantify these issues, a capacity check application was submitted to Southern Water in 2014. This confirmed a lack of sewer capacity and identified the broad works required to provide suitable upgrade works to the public sewer network, to accept the flows from the proposed development. Unfortunately, substantial works bring associated costs and, as would have been the case here, using the above legislation to provide required foul infrastructure would have meant prohibitive expense.

5.14 Due to such issues being experienced in general across the country and the lack of transparency around likely sewer upgrade costs, Ofwat (the economic regulator of the water sector in England and Wales) dictated that sewerage companies should begin consultation on a process of introducing a clear, fair and reasonable schedule of charges for all works within their remit. Of particular interest in the initial consultation document produced by Southern Water in October 2017 in terms of development proposals was a reference to a potential ‘per property’ levy which would be used to address inadequate foul capacity in public sewers.

5.15 These charges were further clarified in the post-consultation document produced by Southern Water entitled ‘New Connections Services - Charging Arrangements 2018-19.’

Included amongst a detailed list of all charges Southern Water may levy is a 'per property' connection fee as outlined below:

Charge	Charge	How is this applied?
New infrastructure charge (development size <20)	£550	Per property
New infrastructure charge (development size >20)	£765	Per property
Old infrastructure charge	£379.62	Per property

5.16 The new charges came into effect on the 1st of April 2018, with a revised document issued for 2019-2020 which did not include changes to these rates. For clarity, the proposal is that the charges collected from all new developments connecting to the sewer network from that date on, will be used to address any capacity issues within Southern Water's area. It has been confirmed that this effectively removes the requirement for the S98 Sewer Requisition process to provide required capacity, provided a new sewer across third party land is not required to allow connection.

5.17 It is not possible to connect direct to the rising main, however, there is an existing private drain within the grounds of Windy Ridge, that connects to the gravity sewer in Thorley Road. It is our client's intention to connect foul flows, possibly via a small private pump, to this infrastructure. This would be formalised by the production of a detailed design and submission of a S106 Connection application, under S106 Water Industry Act 1991.

5.18 As stated above, ultimately these flows are sent for treatment at Southern Water's Main Treatment Plant in Sandown, via Fairlee Transfer station. For clarity, this sidesteps the Nutrient Neutrality issue currently being raised by Natural England. The Isle of Wight Council's Position Statement on the matter (Nitrogen Neutral Housing Development, January 2023) states (page 1, para 4), *'Sandown,… Waste Water Treatment Works (WwTW) outfall into the English Channel.. and are therefore excluded on that basis and developments that will connect to any of these WwTW do not have to demonstrate nutrient neutrality'*. A confirmation email from Southern Water, dated the 12th of April 2023, accompanies this planning submission.

5b Where appropriate, demonstrate how land uses most sensitive to flood damage have been placed within the site that are at least risk of flooding.

5.19 With only a Less Vulnerable use proposed, we consider that, in light of the above investigations and consideration, the development has been appropriately located. Within the site, the proposed dwelling has been located outside of the EA`s Flood Maps for Planning flood zone extents. It is also, vertically, well above the SFRA and revised EA climate change allowances tide and river heights, which means that, within the site

itself, the development has been appropriately located in view of flood risk considerations.

5.20 The Environment Agency`s climate change adjusted maximum still water level (2125) is 3.697 mAOD (Z3). It is clear that with a lower ground floor level of 4.400 mAOD, accommodation at this elevation would be outside (more precisely, above) the flood zone. This allows a freeboard allowance of some 0.703 metres – in excess of that usually specified or required.

5.21 Ordinarily, where a residential use is in a problematic flood zone, a specific safe refuge, positioned above the climate change adjusted water height, is required. However, the whole of this dwelling is above the climate change adjusted tide height (to 2125) and as such, effectively the whole property could be considered as a safe refuge. This further underlines our argument that the sequential test is not required as the proposed dwelling is not within the flood zone – effectively removing the need for any kind of refuge.

5.22 As the whole property is above the climate change adjusted flood levels, including the addition of an industry standard freeboard allowance, we do not consider that a Flood Warning and Evacuation Plan is required. Particularly as access to and from the proposed dwelling would be available, according to the available modelling and climate change adjustments, at all times, during any future flood event. A Flood Warning and Evacuation Plan could be requested via an appropriately worded planning condition, if considered necessary. However, based on our calculations and considerations, this would seem an unnecessarily onerous requirement.

5.23 For clarity, whilst there is no reason it should not be, no sleeping accommodation has been positioned on the lower ground floor or ground floor of the property. Sleeping accommodation is only detailed on the top floor of the proposed dwelling, at a level of 10.80 mAOD, 7.103 metres above the climate change adjusted 2125 tide height. This could be controlled, if considered necessary, via an appropriately worded planning condition.

5.24 As part of the assessment of sensitivity to flood damage, consideration of floating debris has been included in line with FD2320/TR2. The area surrounding the site is predominantly flat, with steeper sections immediately adjacent the site, where land levels fall to the marsh, and similar on the opposite side of the adjacent road, down to the sea. To the south, land is largely undeveloped and relatively flat. Westward is a small gap in built development before the residential development continues into Yarmouth. To the East, residential ribbon development continues for some distance and to the north is The Solent. As such, considering the guidance contained with FD 2320/TR2 in terms of flood

velocity, a flood velocity of around 0.5 m/s is to be expected. Various considerations and calculation methods for flood hazards arising from various types and levels of debris are available but are considered slightly excessive for this level of development. However, Table 13.1 (Danger to people for different combinations of depth and velocity) provides a simple indicator of danger levels from a specific combination of depth and velocity.

5.25 Climate change adjusted flood depths would result in a rating of only a 'Danger for some'. This includes the use of a 'Debris Factor', which in Urban areas is generally set at 1 (likely). This is due to the limited depth of flooding in the vicinity of the site.

5.26 If considered necessary, a condition could be imposed on any consent for this proposal, requiring that the detailed structural design of the proposed unit incorporates consideration of lateral impact loadings – but this seems excessive in this elevated position. This could also include the use of appropriate exterior treatments, resistance to the marine nature of this environment and internal treatments, on the lower ground floor, that are resistant to the unlikely event of inundation by sea water.

5.27 Our client is happy to accept a condition requiring further details of materials and construction techniques in the normal manner.

6 Flood Risk Management Measures

6a How will the site be protected from flooding, including the potential impacts of climate change, over the development's lifetime?

6.1 As outlined in the consideration of flood risks laid out in the preceding sections of this report, we have concluded that no undue risk to life will arise from the construction and occupation of this residential dwelling. However, whilst it was not considered necessary to produce one for this submission, as the site is adjacent to the more problematic flood zones (in plan view) a FWEP may be insisted upon by the Council. This would include an undertaking that occupiers of the site and their visitors, will sign up for the Environment Agency's Floodline Warnings Direct service to receive prior notification of flood events via phone, text and email. However, as stated above, this is considered unnecessary and excessive as even the climate change adjusted (100 year) modelled flood levels will not reach even the lower ground floor level of the dwelling.

6.2 In terms of means of escape from the building, if a flood event were to occur, during both a present day and climate change adjusted flood event, access to Bouldnor Road and onwards to the east to a continuing higher elevation and further travel options, can be achieved via a constantly dry route.

6.3 The fact that the entire building is effectively a safe refuge and the possibility of a dry means of escape remains during an event, has led us to conclude that the threat to life from this development is minimal.

6.4 For clarity, this is because all floors are set above the revised climate change adjusted tide height, for the 1:200-year 2125 tide level, with a minimum 600mm freeboard allowance.

6.5 We do not consider that demountable flood barriers or similar measures are required, in light of the above observations and conclusions.

7 Off Site Impacts

7a How will the proposals ensure that the proposed development and the measures to protect the site from flooding will not increase flood risk elsewhere?

7.1 The constructed element of the proposal is, as shown by the above calculations (Section 4), above the climate change adjusted 2125 flood heights for both tidal and fluvial threats. As such, there will be no impact on flood storage capacity in the area.

7.2 There are no specific measures proposed to protect the site from flooding, so no detrimental impact can arise.

7b How will the proposals prevent run-off from the completed development causing an impact elsewhere?

7.3 As stated in Section 5, the surface water drainage system for the proposed dwelling will limit the post construction flow rates to that calculated in the existing situation (QBAR).

8 Residual Risk

8a - What flood-related risks will remain after the proposals have been implemented to protect the site from flooding?

8.1 We consider that the design considerations and various calculations laid out through this assessment of flood risk indicates that residual risks are limited. The site's location on the edge of Flood Zone 1, the heights of the floors within the proposed dwelling, sleeping accommodation above the climate change adjusted flood heights, the fact that the whole house is effectively a safe refuge and the ability to evacuate both prior to and during even climate change adjusted flood events all limit residual risks. We would therefore suggest that planning conditions which can control the height of the constructed floors and the position of sleeping accommodation (if necessary) will acceptably deal with any residual risks. As we have said, a Flood Warning and Evacuation Plan could also be requested via planning condition, however, given the contents of this report, we are not entirely sure what such a document would say.

8.2 To prevent flooding from a failure of the local urban drainage system, regular maintenance should be undertaken of the existing and proposed gullies, SW sewers and laterals in the vicinity of, and within, the site. Defences, weirs, river confluences and channels should also be maintained to prevent flooding from occurring for storm events.

8b - How, and by whom, will these risks be managed over the lifetime of the development?

8.3 The long-term maintenance of the surface water drains, outfalls, gullies, flow controls and attenuation storage within the site will be the responsibility of the developer, landowner or a management company which may be set up to maintain the site. Those positioned within Bouldnor Road and the surrounding area are the responsibility of third parties – Isle of Wight Council and Island Roads, where applicable.

REFERENCES

1. Communities and Local Government (2021) National Planning Policy Framework (NPPF)

2. Planning Practice Guidance, Flood Risk and Coastal Change, 6th March 2014.

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4. Development and Flood Risk: A Practice Guide Companion to PPS25. (Feb 2007). Communities and Local Government. HMSO, London.

5. Isle of Wight Council's Strategic Flood Risk Assessment Mk 2 (2010) produced by Entec Consultants.

6. Preliminary Flood Risk Assessment (2011) produced by Amec on behalf of the Isle of Wight Council

7. Policy DM14 Flood Risk of the Core Strategy Island Plan adopted March 2012

8. Island Planning Strategy Development plan, published for consultation July 2021, by the Isle of Wight Council.