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Flood Risk Assessment for the Proposed Development at Land at Short Lane, Alkham, Kent

April 2023

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Project Reference: 3661

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Flood Risk Assessment for the Proposed Development at Land at Short Lane, Alkham, Kent

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Contents Page

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1 Scope of Appraisal

Herrington Consulting has been commissioned by Mr David Barnes to prepare a Flood Risk Assessment (FRA) for the proposed development at **Land at Short Lane, Alkham, Kent, CT15 7BZ.**

The objectives of the Flood Risk Assessment (FRA) are therefore to establish the following:

- whether a proposed development is likely to be affected by current or future flooding from any source.
- whether the development will increase flood risk elsewhere within the floodplain.
- whether the measures proposed to address these effects and risks are appropriate.

This appraisal has been undertaken in accordance with the requirements of the National Planning Policy Framework (2021) and the National Planning Practice Guidance Suite (August 2022) that has been published by the Department for Communities and Local Government. The *Flood Risk and Coastal Change* planning practice guidance included within the Suite represents the most contemporary technical guidance on preparing FRAs. In addition, reference has also been made to Local Planning Policy.

To ensure that due account is taken of industry best practice, this FRA has been carried out in line with the CIRIA Report C624 'Development and flood risk - guidance for the construction industry'.

2 Background Information

2.1 Site Location and Existing Use

The site is located at OS coordinates 625930, 142310, off Short Lane in Alkham. The site covers an area of approximately 0.32 hectares and currently comprises undeveloped greenfield land. The location of the site in relation to the surrounding area is shown in Figure 2.1.

Figure 2.1 – Location map (contains Ordnance Survey data © Crown copyright and database right 2023).

The site plan included in Appendix A.1 of this report provides more detail in relation to the site location and layout.

2.2 Proposed Development

The proposals for development comprise the construction of 8no. residential dwellings (Figure 2.2).

Figure 2.2 – Proposed draft site layout.

Drawings of the proposed scheme are included in Appendix A.1 of this report.

2.3 The Sequential Test and Exception Test

Local Planning Authorities (LPA) are encouraged to take a risk-based approach to proposals for development in or affecting flood risk areas through the application of the Sequential Test. The objectives of this test are to steer new development away from high risk areas towards those areas at lower risk of flooding. However, in some locations where developable land is in short supply there can be an overriding need to build in areas that are at risk of flooding. In such circumstances, the application of the Sequential Test is used to ensure that the lower risk sites are developed before the higher risk ones.

In this case, reference to Dover District Council's draft Local Plan reveals that the site is proposed for allocation under Policy SAP43. The Sequential Test will be applied as part of the allocation process and therefore, the Sequential Test is considered to be passed.

In addition to the Sequential Test, the requirements for applying the Exception Test have been reviewed. In this case, reference to the Environment Agency's 'Flood Map for Planning' shows that the development site is situated within Flood Zone 1 (refer to Figure 2.3 below).

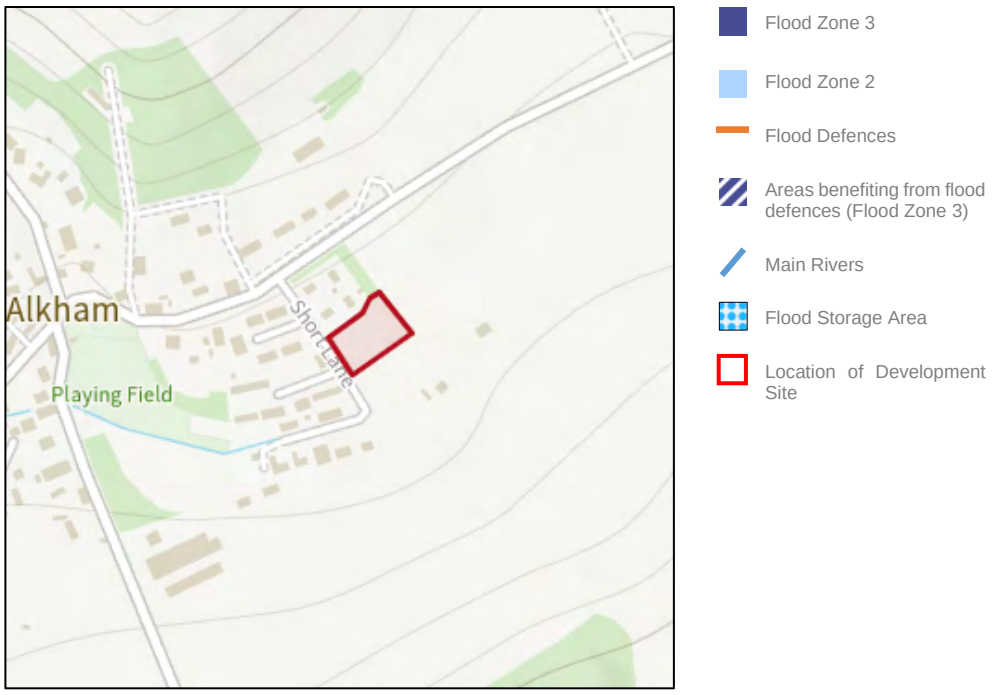


Figure 2.3 – EA's 'Flood Map for Planning' (© Environment Agency).

Reference to Table 2 of the NPPG states that for 'more vulnerable' development in Flood Zone 1, as it is the case here, the Exception Test is not required. Notwithstanding this, the NPPF states that the risk of flooding should be considered from all sources and therefore, this is the primary aim of this report.

2.4 Site Specific Information

Information from a wide range of sources has been referenced to appraise the true risk of flooding at this location. This section summarises the additional information collected as part of this FRA.

Information contained within the SFRA – The Dover District Council SFRA (2019) contains detailed mapping showing historic flood records for a wide range of sources. This document has been referenced as part of this site-specific FRA.

Information provided by Southern Water – Southern Water has provided the results of an asset location search for the site. The response is included in Appendix A.2.

Site specific topographic surveys – A site-specific topographic survey has not been undertaken at this stage; however, inspection of aerial height data (LiDAR) records show that the land levels of the site vary between 51.8m and 58.7m Above Ordnance Datum Newlyn (AODN). Land levels are highest in the north of the site and fall towards the eastern boundary of the site. Inspection of the LiDAR shows no topographical low points.

Geology – Reference to the British Geological Survey (BGS) map shows that the underlying solid geology in the location of the subject site is Holywell Nodular Chalk Formation (chalk). Overlying this are superficial deposits of Alluvium (clay, silt, sand and gravel).

Historic flooding – Information provided by the SFRA and The EA's Historic Flood Map GIS data shows that there are no records of historic flood events at the site and immediate surrounding area.

Existing Flood Risk Management Measures – There are no formal flood defence structures that provide protection to the development site.

2.5 Planning Horizon

To ensure that any recommended mitigation measures are sustainable and effective throughout the lifetime of the development, it is necessary to base the appraisal on the extreme flood level that is commensurate with the planning horizon for the proposed development. The NPPF and supporting Planning Practice Guidance Suite state that residential development should be considered for a minimum of 100 years, but that the lifetime of a non-residential development depends on the characteristics of the development. The development that is the subject of this FRA is classified as residential, therefore a design life of 100 years has been assumed.

2.6 Potential Changes in Climate

Peak Rainfall Intensity

Recognising that the impact of climate change will vary across the UK, the allowances were updated in May 2022 to show the anticipated changes to peak rainfall across a series of management catchments. The proposed development site is located in the **Stour Management Catchment**, as defined by the 'Peak Rainfall Allowance' maps, hosted by the Department for Environment, Food and Rural Affairs. Guidance provided by the EA states that this mapping should be used for site-scale applications (e.g. drainage design), in small catchments (less than 5km^2), or urbanised drainage catchments. For large rural catchments, the peak river flow allowances should be used.

The development site lies within a small drainage catchment and therefore, the Peak Rainfall Allowances for the Stour Management Catchment should be applied.

For each Management Catchment, a range of climate change allowances are provided for two time epochs and for each epoch, there are two climate change allowances defined. These represent different levels of statistical confidence in the possible scenarios on which they are calculated. The two levels are as follows:

- Central: based on the 50th percentile
- Upper End: based on the 90th percentile

The EA has provided guidance regarding the application of the climate change allowances and how they should be applied in the planning process. The range of allowances for the Management Catchment in which the development site is located are shown in Table 2.1 below.

Management Catchment Name	Annual exceedance probability	Allowance Category	2050s	2070s
Stour	3.3 %	Central	20%	20%
		Upper End	40%	40%
	1 %	Central	20%	20%
		Upper End	45%	45%

Table 2.1 – Recommended peak rainfall intensity allowances for each epoch for the Stour Management Catchment.

For a development with a design life of 100 years the 'Upper End' climate change allowance is recommended to assesses whether:

- there is no increase in flood risk elsewhere, and;
- the development will be safe from surface water flooding.

From Table 2.1 above, it can be seen that the recommended climate change allowance for this site is a 45% increase in peak rainfall.

All of the above recommended allowances for climate change should be used as a guideline and can be superseded if local evidence supports the use of other data or allowances. Additionally, in the instance where flood mitigation measures are not considered necessary at present, but will be required in the future to account for changes in the climate, a "managed adaptive approach" can be adopted. This approach allows appropriate mitigation measures to be incorporated into the development in the future to combat the impacts of climate change.

3 Potential Sources of Flooding

The main sources of flooding have been assessed as part of this appraisal. The specific issues relating to each one and its impact on this development are discussed below.

3.1 Flooding from Rivers

Inspection of OS mapping identifies that there are no watercourses nearby and the site is not located within an area identified by the EA's 'Flood Map for Planning' as being at risk of flooding from a main river. Consequently, the risk of flooding from this source is considered to be *low.*

3.2 Flooding from Ordinary or Man-Made Watercourses

Inspection of the site and surrounding area reveals that there is a drainage ditch to the southwest of the site. Reference to aerial height data shows that land levels in the area of the proposed development are approximately 1m higher than land levels immediately surrounding the drainage ditch. Furthermore, the natural topography of the surrounding area suggests that if water was to exceed the capacity of the drainage ditch, it would flow away from the site in a north-easterly direction. The risk of flooding from water flowing overland is appraised further in Section 3.4.

3.3 Flooding from the Sea

The site is located a significant distance inland and is elevated well above predicted extreme tide levels. Consequently, the risk of flooding from this source is considered to be *low*.

3.4 Flooding from Surface Water

The EA's 'Flood Risk from Surface Water' map (Figure 3.1) shows the development site is located in an area classified as having a 'very low' to 'high' risk of surface water flooding. Therefore, the risk of flooding from this source is investigated further.

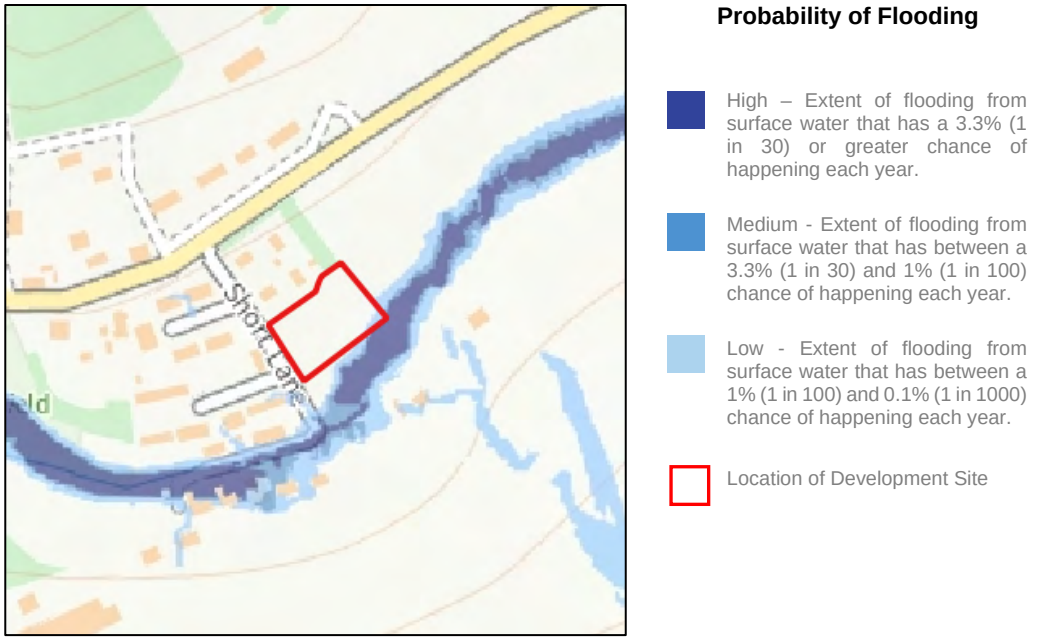


Figure 3.1 – EA's 'Flood Risk from Surface Water' map (© Environment Agency).

It has been identified that the site could be affected by flooding from water flowing overland based on the EA's 'Flood Risk from Surface Water' mapping (Figure 3.1). To understand the risk of flooding from this source in more detail, the EA's 'Flood Risk from Surface Water' map has been interrogated further for a range of return period events (referred to as the 'likelihood of occurrence') to show the predicted extent and depth of flooding across the site (Figure 3.2).

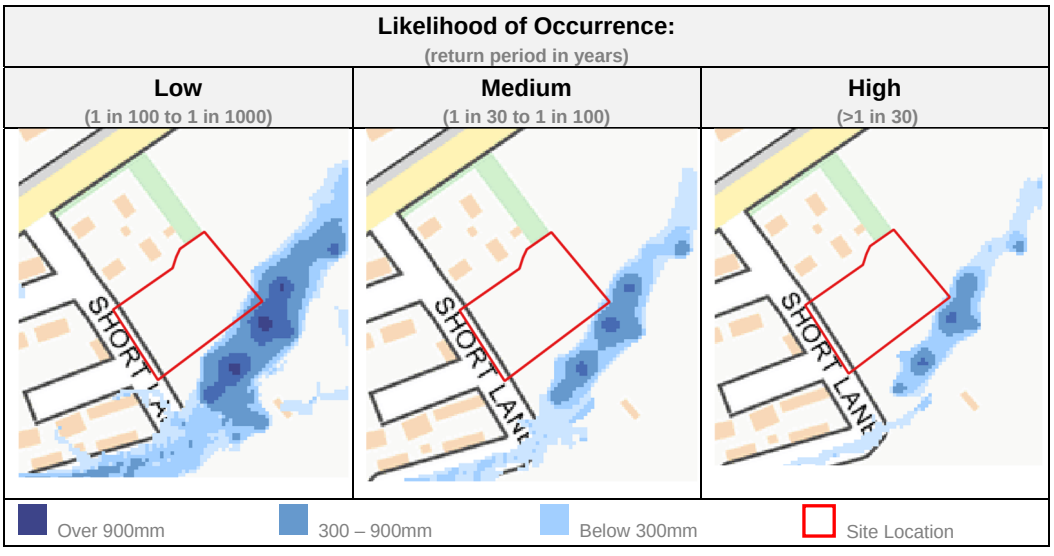


Figure 3.2 – EA's 'Risk of Flooding from Surface Water' Maps showing indicative flood depths for a range of return periods (© Environment Agency).

The pluvial 'design flood event' is taken as the 1 in 100 year return period event (1% AEP) including a 45% allowance for climate change (refer to Section 2.5). Whilst the EA's mapping in Figure 3.2 does not include an allowance for climate change, the maps do include a modelled scenario

whereby a rainfall event is applied which exceeds the design flood event, represented by the 'low' likelihood of occurrence event. Data derived from the Depth-Duration-Frequency model obtained from the Flood Estimation Handbook web service indicates that the rainfall depth of the 1 in 1000 year rainfall event is over 47% greater than the 1 in 100 year rainfall event. Consequently, this scenario is likely to overestimate the impacts of climate change. Nevertheless, in the absence of any other data, the outputs from the 1 in 1000 year extreme rainfall event have been referenced.

For such a scenario, comparison of the predicted extent of flooding with aerial height data identifies that the maximum predicted flood level at the site is approximately 52.6m AODN. This results in a maximum predicted depth of up to 800mm within the eastern corner of the site, where land level are lowest. Notwithstanding this, reference to aerial height data shows that all proposed units are situated above a level of 52.9m AODN and therefore, would remain dry. It is therefore concluded that the risk of flooding to the proposed development is *low*.

3.5 Flooding from Groundwater

Inspection of the groundwater flood risk mapping data shows that the general area in which the development site lies is identified as being at 'low' risk from groundwater flooding. In addition, there no recorded incidents of groundwater flooding at the site or immediate surrounding area during the very wet periods of 2000/01 or 2002/03.

Notwithstanding this, the underlying geology in this area is Holywell Nodular Chalk Formation (chalk), overlain by superficial deposits of Alluvium (clay, silt, sand and gravel). This type of geology can support groundwater flows and can be associated with groundwater emergence. This is supported by the Defra Groundwater Flood Scoping Study (May 2004) which shows that the site is located within an area where groundwater emergence is predicted.

If groundwater was to emerge at or near to the site, it would simply follow the natural topography and flow towards the drainage ditch to the south of the site, away from the proposed development. The risk of flooding from emerging groundwater can be associated with water flowing overland which has been appraised in more detail in Section 3.4 above and has been concluded to be *low*.

3.6 Flooding from Sewers

Inspection of the asset location mapping provided by Southern Water (Figure 3.3) identifies that the sewers in this area are foul only. The nearest public sewer to the site is a foul sewer which is located further to the south of the site, within the valley.

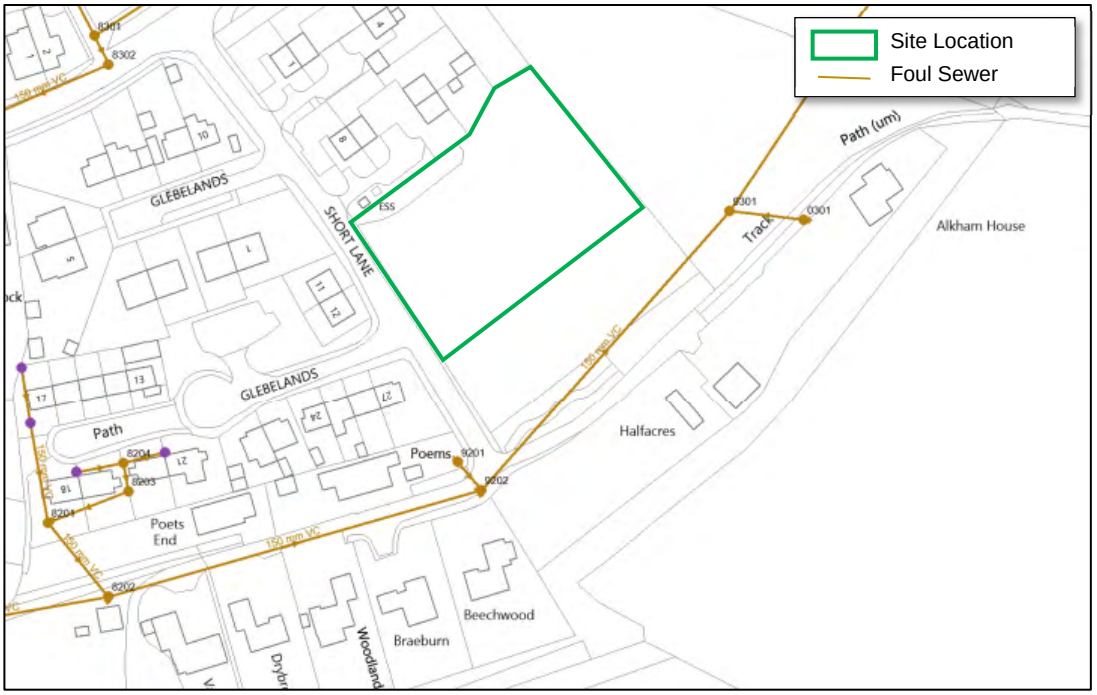


Figure 3.3 - Asset location mapping provided by Southern Water (a full scale copy can be found in Appendix A.2).

The topography of the land within the site and the surrounding area suggests that any above ground flooding that might occur as a result of a surcharged sewer would follow the natural topography of the site and flow to the south towards the drainage ditch and away from the site. This is also supported by the asset location mapping, which indicates that if water was to exit the sewer network, i.e. as a result of a blockage or exceedance of capacity, it is likely to occur at the manhole further to the east of the site. Consequently, the risk of flooding from this source is therefore considered to be *low*.

3.7 Flooding from Reservoirs, Canals and Other Artificial Sources

The potential effects of flood risk management infrastructure and other structures also needs to be considered. For example, reservoir or canal flooding may occur as a result of the facility being overwhelmed and/or as a result of dam or bank failure.

Inspection of the OS mapping for the area shows that there are no artificial sources of flooding within close proximity to the site. In addition, the EA's 'Flood Risk from Reservoirs' map shows that the site is not within an area considered to be at risk of flooding from reservoirs. Therefore, the risk of flooding from this source is considered to be *low.*

4 Offsite Impacts and Other Considerations

4.1 Displacement of Floodwater

It has been identified that a small area of the south-eastern corner of the site could be affected by water flowing overland. In order to ensure that any proposed development does not adversely affect the existing flow path and displace floodwater, no solid structures should be located below the maximum predicted flood level of 52.6m AODN. Inspection of the scheme drawings shows that this has been achieved. In addition, whilst the eastern corner of the site can still be used for greenspace, no land raising should be undertaken below a level of 52.6m AODN. This will ensure that water can continue to flow naturally across the land, without increasing the risk offsite.

4.2 Public Safety and Access

The NPPF states that safe access and escape should be available to/from new developments located within areas at risk of flooding. The Practice Guide goes on to state that access routes should enable occupants to safely access and exit their dwellings during design flood conditions and that vehicular access should be available to allow the emergency services to safely reach the development.

It can be seen that the proposed residential units and access road of the development are located outside of the predicted flood extents from overland flow paths and consequently, safe access and escape from the dwellings can be achieved. In addition, inspection of the wider flood mapping shows that there would be safe dry vehicular access to the site under an extreme flood event.

5 Flood Mitigation Measures

5.1 Application of the Sequential Approach at a Local Scale

For the development that is the subject of this FRA it can be seen that this approach has been adopted and the residential units are located outside of the predicted flood extents.

In addition, the sequential approach should be adopted to the internal layout of the buildings by locating all 'more vulnerable' elements (i.e. sleeping accommodation) on the first floor.

5.2 Raising Floor Levels & Land Raising

The EA recommends that the minimum floor level of buildings at risk of flooding should be 300mm above the design flood level, which for the pluvial event is the 1 in 100 year extreme water level plus the appropriate allowance for climate change.

Comparison of the draft site layout with aerial height data shows that the residential units are situated on higher land, i.e. above the level of 52.9m AODN. This is over 300mm above the maximum predicted flood extent and therefore, the EA's requirements for minimum floor levels have been achieved.

Notwithstanding this, it is still recommended that all dwellings have a minimum threshold of 150mm above ground level to help prevent the ingress of floodwater caused by any localised surface water flooding.

5.3 Flood Resistance and Resilience

During a flood event, floodwater can find its way into properties through a variety of routes including:

- Ingress around closed doorways.
- Ingress through airbricks and up through the ground floor.
- Backflow through overloaded sewers discharging inside the property through ground floor toilets and sinks.
- Seepage through the external walls.
- Seepage through the ground and up through the ground floor.
- Ingress around cable services through external walls.

Since flood management measures only manage the risk of flooding rather than eliminate it completely, flood resilience and resistance measures may need to be incorporated into the design of the buildings. The two possible alternatives are:

Flood Resistance or 'dry proofing', where flood water is prevented from entering the building. For example, using flood barriers across doorways and airbricks, or raising floor levels. These measures are considered appropriate for 'more vulnerable' development where recovery from internal flooding is not considered to be practical.

Flood Resilience or 'wet proofing', accepts that flood water will enter the building and allows for this situation through careful internal design for example raising electrical sockets and fitting tiled floors. The finishes and services are such that the building can quickly be returned to use after the flood. Such measures are generally only considered appropriate for some 'less vulnerable' uses and where the use of an existing building is to be changed and it can be demonstrated that no other measure is practicable.

It has been demonstrated as part of this FRA that the proposed dwellings have been located outside the predicted extent of flooding under design event conditions. Notwithstanding this, it is still recommended that flood resistance and resilience measures are considered as a precautionary approach.

Details of flood resilience and flood resistance construction techniques can be found in the document '*Improving the Flood Performance of New Buildings; Flood Resilient Construction'*, which can be downloaded from www.gov.uk.

A Code of Practice (CoP) for Property Flood Resilience (PFR) has been put in place to provide a standardised approach for the delivery and management of PFR. Further information on the CoP and guidance on how to make a property more flood resilient can be accessed, and downloaded, from the Construction Industry Research and Information Association (CIRIA) Website:

https://www.ciria.org/Resources/Free_publications/CoP_for_PFR_resource.aspx

5.4 Flood Warning

Inspection of the EA's 'Flood Risk from Surface Water' map (Figure 3.1) suggests that the south-eastern corner of the site could experience flooding following an extreme rainfall event. Whilst the probability of an event of sufficient magnitude to cause water to reach the site is low, the risk of such an occurrence is always present. It is therefore recommended that residents monitor the Met Office's Weather Warnings to receive forewarning of weather conditions which could result in flooding:

www.metoffice.gov.uk/weather/uk/uk_forecast_warnings.html

5.5 Surface Water Management

The general requirement for all new development is to ensure that the runoff is managed sustainably, and that the development does not increase the risk of flooding at the site, or within the surrounding area. In addition, the NPPF states that sustainable drainage systems should be incorporated in areas at risk of flooding and therefore, use of SuDS has been considered with the aim of minimising the risk of flooding both on and off site.

A range of typical SuDS that can be used to improve the environmental impact of a development is listed in Table 5.1 below along with the relative benefits of each feature and the appropriateness for the subject site.

SuDS	Description	Constraints/Comments	Appropriate for site?
Rainwater Harvesting Systems	Collecting of rainwater and storing for reuse on site, e.g., in form of water butts	No known constraints	Yes
Green Roofs	Provide landscaping and planting at roof level to reduce surface water runoff rates	Unsuitable roof design	No
Infiltration Systems	Allow water to percolate into the ground at a controlled rate via natural infiltration	Infiltration rates would need to be confirmed Potentially high groundwater	Unknown
Filter Strips	Wide, gently sloping, densely planted areas promoting sedimentation and filtration	Insufficient space on site	No
Filter Drains	Trenches infilled with stone/gravel providing attenuation, sedimentation and filtration	Insufficient space on site	No
Swales	Broad, shallow channels that convey and store runoff, and allow infiltration	Insufficient space on site	No
Bioretention Systems / Rain Gardens	A shallow landscaped depression allowing runoff to pond temporarily on the surface or planters/tree crates designed specifically to intercept and store stormwater	No known constraints	Yes
Pervious Surfacing	Runoff is allowed to soak into structural paving and stored, potentially being allowed to infiltrate	No known constraints	Yes
Attenuation Storage Tanks	Large, below ground voided spaces, which can be used to temporarily store storm water	No known constraints	Yes
Detention Basins	A landscaped depression for attenuation with a restricted runoff	Insufficient space on site	No
Ponds and Wetlands	A permanent pool of water which can be used for attenuation and controlled outflows by water levels	Insufficient space on site	No

Table 5.1 – Suitability of SuDS.

From Table 5.1, it can be seen that there are a number of potentially suitable SuDS to be included within the scheme. It is recommended that the opportunity to include these measures is explored further as part of a detailed design. The primary aim of specifying SuDS would be to reduce the rate of discharge from the site where possible and ensure there is no increase in risk of flooding offsite as a result of the development in accordance with the principles promoted by the NPPF.

6 Conclusions and Recommendations

The overarching objective of this report is to appraise the risk of flooding at Land at Short Lane, Alkham, to ensure that the proposals for development are acceptable and that any risk of flooding to the residents of the proposed residential units is appropriately mitigated. In addition, the NPPF also requires the risk of flooding offsite to be managed, to prevent any increase in flood risk as a result of the development proposals. This report has therefore been prepared to appraise the risk of flooding from all sources, in accordance with the NPPF and local planning policy.

The site is allocated as part of Dover District Council's draft Local Plan and therefore, the requirements of the Sequential Test are therefore considered to have been met. In addition, it can be seen that the proposed development is situated within a Flood Zone 1 and is a development type that is classified as being 'more vulnerable'. For such a combination of risk and vulnerability, the NPPF does not require the Exception Test to be applied. Notwithstanding the above, the NPPF and Dover District Council SFRA (2019) state that the risk of flooding should be considered from all sources.

The risk of flooding has therefore been appraised across a wide range of sources and it has been identified that the risk of flooding to the site is limited to water flowing overland, either as a result of groundwater emergence or surface water accumulating within the adjacent valley. Further interrogation of the risk shows that under design event conditions, the maximum predicted flood level at the site is 52.6m AODN.

Notwithstanding this, all residential units are situated on land levels above 52.9m AODN. In addition, the sequential approach has been adopted to the internal layout with all sleeping accommodation proposed to be located on the first floor. In addition, all dwellings should incorporate a minimum 150mm threshold to help prevent the ingress of floodwater from any localised surface water flooding alongside the use of flood resistance and resilience measures. It is further recommended that the residents of the proposed units monitor the Met Office Weather Warnings to forewarn of an extreme weather event that could result in surface water flooding.

With these measures in place, it is considered that the risk of flooding to the proposed development is low from all sources (refer to Table 6.1 below).

Source of Flooding	Level of Risk	Appraisal method applied at the initial flood risk assessment stage
Rivers	Low	OS mapping and the EA's 'Flood Map for Planning'
Sea	Low	OS mapping and the EA's 'Flood Map for Planning'
Ordinary and Man-Made Watercourses	Low	OS mapping and aerial height data
Surface Water	Low*	EA's 'Flood Risk from Surface Water' map, and historic records contained within the Dover District Council SFRA, aerial height data, OS mapping
Groundwater	Low*	BGS groundwater flood hazard maps, Defra Groundwater Flood Scoping Study, site-specific geological data, aerial height data, OS mapping
Sewers	Low	Aerial height data, OS mapping, historic records in the SFRA , asset location data provided by Southern Water
Artificial Sources	Low	OS mapping and EA's 'Flood Risk from Reservoirs' map

*Table 6.1 – Summary of flood sources and risks. *Including mitigation measures.*

Furthermore, the impermeable area within the site will increase as a result of development at this site and therefore, it will be necessary to incorporate SuDS within the scheme. This is to ensure that the development does not increase the risk of flooding from surface water onsite or offsite. It is considered that sufficient space is available onsite to manage surface water runoff in accordance with the NPPF and local guidance.

In conclusion, following the recommendations of this report, the residents of the development will be safe and the development will not increase the risk of flooding elsewhere. Consequently, it has been demonstrated that the development will meet the requirements of the NPPF.

7 Appendices

Appendix A.1 – Drawings

Appendix A.2 – Southern Water Asset Location Data

Appendix A.1 – Drawings

0 5 10 15 20 25 30 35 40 45

revisions

APX ARCHITECTURE

Kemp House, 160 City Road, London. EC1V 2NX

project title

Proposed residential accommodation
Land at Short Lane
Alkham
Kent

drawing title

Sketch Layout Plan

scale

1:500@A1

date

January 2023

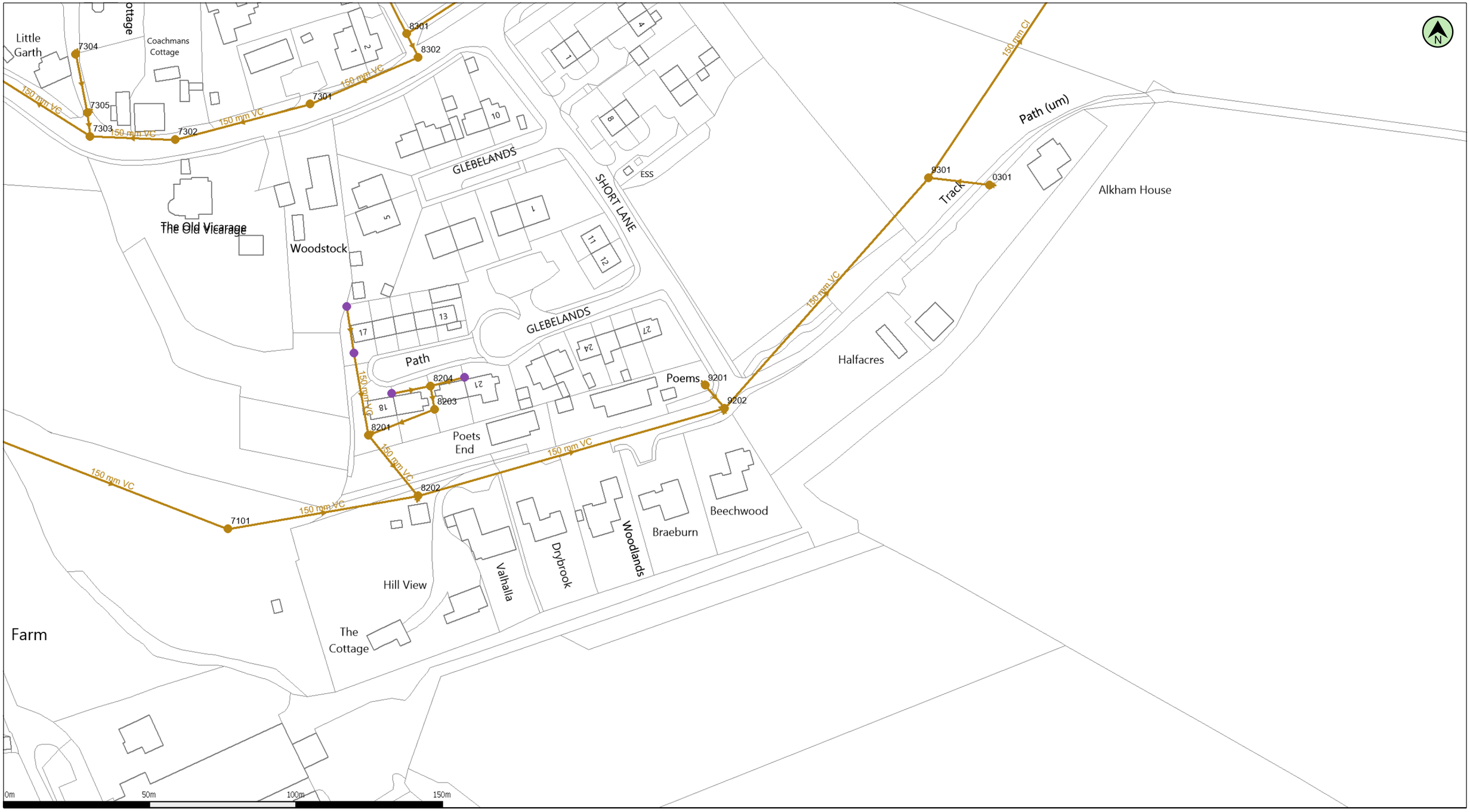
drawing number

22_114_SK01

revision

A

Appendix A.2 – Southern Water Asset Location Data



(c) Crown copyright and database rights 2023 Ordnance Survey 100031673 | Date: 05/01/23 | Scale: 1:1250 | Map Centre: 625930,142233 | Data updated: 27/10/22 | Our Ref: 1050312 - 1 | Wastewater Plan A3

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2023 Ordnance Survey 100031673 .This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.

Foul Gravity Sewer
Combined Gravity Sewer
Culverted Water Course or Treated Effluent
Surface Water Gravity Sewer
Rising Main, Vacuum or Syphon
Combined Outfall
Surface Water Outfall
Foul Outfall
Surface Water Inlet
Combined Pumping Station
Surface Water Pumping Station
Foul Pumping Station
WWTW Water Treatment Works
Section 104 Area
Building Over Agreement Area
Foul Manhole
Combined Manhole
Surface Water Manhole
Side Entry Manhole, Decarcation Chamber, Dummy Manhole or Surface Water Soakaway

flood@herringtonconsulting.co.uk

LM/3661

WATER for LIFE from Southern Water

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
0301	F	53.30	51.24	
7101	F	53.64	51.94	
7301	F	64.85	62.67	
7302	F	64.33	62.39	
7303	F	62.85	61.33	
7304	F	65.63	64.28	
7305	F	62.83	61.78	
8201	F	54.32	52.86	
8202	F	53.75	51.49	
8203	F	0.00	0.00	
8204	F	0.00	0.00	
8301	F	64.99	63.52	
8302	F	64.09	62.83	
9201	F	52.81	51.18	
9202	F	52.47	50.89	
9301	F	51.39	50.19	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert