



Flood Risk Assessment

Site: Warren Hastings Court, Gravesend, Kent

Client: Billings Group

Prepared by: DHA Environment
Eclipse House
Eclipse Park
Sittingbourne Road
Maidstone ME14 3EN

Date: September 2021

1.1 Introduction

- 1.1.1 DHA has been commissioned by Billings Group to prepare a Flood Risk Assessment in relation to the conversion of two number existing ground floor industrial units to four number flats at Warren Hastings Court, The Shore, Gravesend, Kent.
- 1.1.2 The development is shown the Environment Agency flood maps to be located on the edge of defended Flood Zone 3 and as such the Flood Risk Assessment has been prepared to support the change of use planning application.

1.2 Summary of existing development

Location

- 1.2.1 The site is located to the South of The Shore and is centred on approximate grid reference 563795,174460. The site comprises of an existing building and associated car parking to the South. The existing site is currently 100% impermeable.

Existing Site

- 1.2.2 A topographical survey of the site is shown on drawing 1594/21 contained within **Appendix A**. The existing three-storey building has residential accommodation on the upper two floors consisting of eight flats, along with two units of existing B1c light industrial usage on the ground floor. The most recent usage for the ground floor units is understood to have been vehicle servicing workshops.
- 1.2.3 The ground floor is set at a level of 6.91m AOD with the adjacent footway slightly lower at a level of 6.75m AOD. Ground levels to the South and West of the building are a storey higher at a level of circa 11.61m AOD with levels continuing to raise to the South.
-

1.2.4 The site has the following boundary conditions:

- North – The Shore with the River Thames beyond.
- East – Industrial units.
- South – Residential development.
- West – Pier Road with residential development beyond

1.3 Surface Water Features

1.3.1 The nearest surface water feature is the River Thames which is located approximately 15m to the North of the site.

1.4 Flood Risk

General

1.4.1 The proposals consist of the conversion of the two existing ground floor industrial units to four number flats. The proposed scheme drawings are shown within **Appendix B**.

Flood Risk Zones

1.4.2 The National Planning Policy Framework provides guidance on assessing flood risk and seeks to guide development away from areas at risk of flooding from all sources. Planning Practice Guidance defines a number of Flood Zones based on the probability of flooding and provides guidance on the most appropriate form of development within each zone. The flood risk can be summarised as follows:

Zone	Annual probability in any year	
	River Flooding	Sea Flooding
Zone 1 : Low probability	Less than 1:1000 (<0.1%)	Less than 1:1000 (<0.1%)
Zone 2: Medium probability	Between 1:1000 and 1 in 100 (0.1% -1%)	Between 1:1000 and 1 in 200 (0.1% - 0.5%)
Zone 3a : High probability	Greater than 1:100 (>1%)	Greater than 1:200 (>0.5%)
Zone 3b: Functional floodplain	Greater than 1 in 20 (>5%)	N/A

Table 1 – NPPF Guidance

1.4.3 Reference has been made to the Product 4 report reference KSL218799 AC obtained from the Environment Agency contained in **Appendix C**. This indicates that the site is shown to be located entirely within Flood Zone 1 however it is bounded to the North by defended Flood Zone 3a.

- 1.4.4 Flood Zone 3a is considered to have a high probability risk of flooding from rivers or other sources of flooding. This Flood Zone comprises of land assessed as having a greater than 1 in 100 annual probability of river flooding (1%) or 1 in 200 or greater annual probability of sea flooding (>0.5%) in any year. The flood maps are based on the worst-case scenario and does not account for the existing raised flood defences.
- 1.4.5 Flood defences are inspected twice a year and are graded between 1 (very good) and 5 (very poor). The defences in the vicinity of the development have been classified as grade 2. The flood defences are set at a crest level of 6.87m AOD and provide a 1 in 1000 year level of protection to the site.
- 1.4.6 The Environment Agency has provided details of the predicted flood levels in the River Thames near the site as taken from the latest TE2100 model. Levels are described as the Maximum Likely Water Levels (MLWLs). The defence levels (left defence, right defence) are the minimum levels that defences should be built. As summary of the MLWLs are shown in tables 2 and 3 below.

Location	Node	Easting	Northing	Extreme water level (m)	Left defence (m)	Right defence (m)	Allow for future defence raising to a level of...	
							Left Bank (m)	Right Bank (m)
Tilbury lock	3.24	562822	174891	5.83	6.50	6.73	8.00	8.00
	3.25	564140	174785	5.81	6.95	6.87	8.00	8.00
Gravesend	3.26	565310	174817	5.78	6.65	6.75	8.00	8.00

Table 2 - TE2100 2008 levels Maxi Likely Water Levels (MLWLs)

Location	Node	Easting	Northing	1000-year design water levels					
				2000	2040	2070	2100	2120	2170
Tilbury lock	3.24	562822	174891	5.83	6.04	6.19	6.49	6.69	7.18
	3.25	564140	174785	5.81	6.02	6.17	6.47	6.67	7.19
Gravesend	3.26	565310	174817	5.78	5.99	6.14	6.44	6.65	7.19

Table 3 - TE2100 Climate Change Levels

- 1.4.7 The TE2100 climate change level closest to the site, is node 3.25 and shows a current Maximum Likely Water Level of 5.81m AOD raising to 6.67m AOD for the 2120 epoch for the 1000 year flood event (Tables 2 and 3). Defence level to the right-hand bank can be seen to be 6.87m AOD. Comparing the flood levels with the topographical survey demonstrates the site can be seen to be located entirely within Flood Zone 1.
- 1.4.8 Although the immediate flood risk has been mitigated with the existing flood defences there still remains a residual risk in the event of a failure in the form of a breach. The Environment Agency have provided specific breach modelled flood levels for the site. The Maximum Likely Water Levels (MLWLs) for varying nodes around the site are summarised in Table 4.

Node	National Grid Reference		Modelled levels in mAODN for 0.5% AEP		Modelled levels in mAODN for 0.1% AEP	
	Easting	Northing	2014	2115	2014	2115
1	563808	174446	Nil return	Nil return	Nil return	6.40
2	563812	174462	5.37	6.20	5.73	6.46
3	563817	174476	5.37	6.23	5.74	6.50
4	563798	174471	5.37	6.23	5.74	6.53
5	563776	174468	Nil return	6.23	5.74	6.53
6	563753	174471	Nil return	Nil return	Nil return	6.61
7	563769	174451	Nil return	Nil return	Nil return	Nil return
8	563816	174426	Nil return	6.17	Nil return	6.46

Table 4 - Breach Levels

- 1.4.9 The existing finished floor level of 6.91m AOD can be seen to be between 0.38m and 0.68m above the breach levels for both the 1 in 200 and 1 in 1000 year events for year 2115 demonstrating the building is not at risk of flooding from the River Thames.

Sequential and Exception Tests

- 1.4.10 The National Planning Policy Framework, states that change of use applications should not be subject to the sequential or exception tests.

1.5 Proposed Development

- 1.5.1 The proposal consists of the conversion of the existing ground floor industrial units to four number flats.

Proposed Surface Water Drainage

- 1.5.2 The proposals consist entirely internal and elevational changes and as such there will be no changes to the existing surface water drainage regime.

Proposed Foul Water Drainage

- 1.5.3 A peak foul water flow of 0.19 l/s has been calculated for a development of 4 residential units. This is based on the daily flow rate of 4,000 litres given in Sewers for Adoption 7th Edition for residential. The foul drainage will connect into the existing foul drainage system.

1.6 Conclusions

- 1.6.1 Based on the topographical survey and the Environment Agency flood data the site can be seen to be located within Flood Zone 1.
- 1.6.2 The proposals consist entirely internal and elevational changes and as such there will be no changes to the existing surface water drainage.

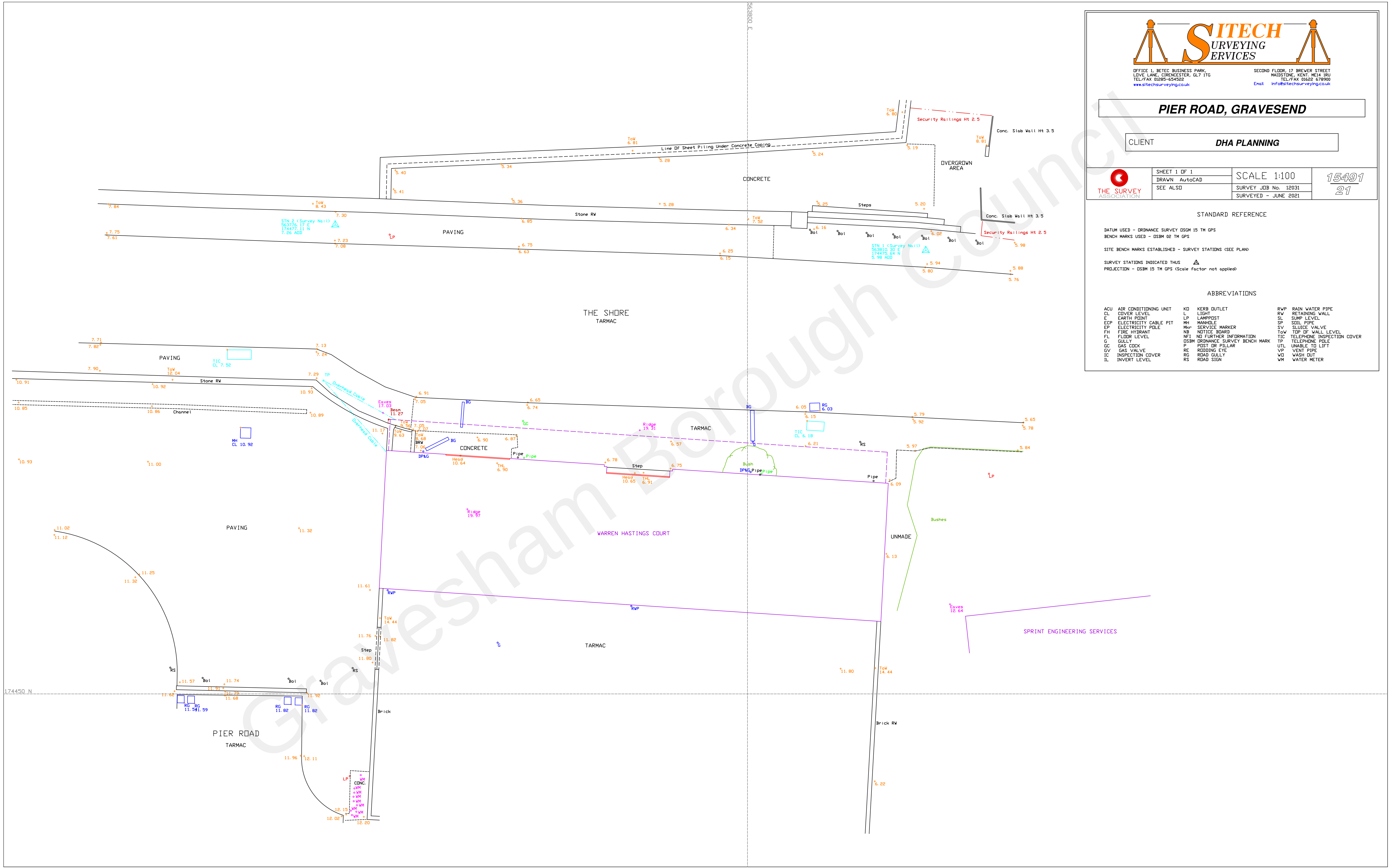
APPENDIX

A



Topographical Survey

Gravesham Borough Council



OFFICE 1, BETEC BUSINESS PARK,
LOVE LANE, CROCHESTER, G17 1TG
TEL/FAX 01285-694522
www.sitechsurveying.co.uk

SECOND FLOOR, 17 BREWER STREET
MAIDSTONE, KENT, ME14 1RU
TEL/FAX 01622 678900
Email info@sitechsurveying.co.uk

PIER ROAD, GRAVESEND

CLIENT **DHA PLANNING**



SHEET 1 OF 1
DRAWN AutoCAD
SEE ALSO

SCALE 1:100
SURVEY JOB No. 12031
SURVEYED - JUNE 2021

15491
21

STANDARD REFERENCE

DATUM USED - ORDNANCE SURVEY ODSM 15 TM GPS

BENCH MARKS USED - ODSM 02 TM GPS

SITE BENCH MARKS ESTABLISHED - SURVEY STATIONS (SEE PLAN)

SURVEY STATIONS INDICATED THUS 
PROJECTION - ODSM 15 TM GPS (Scale factor not applied)

ABBREVIATIONS

ACU	AIR CONDITIONING UNIT	KD	KERB OUTLET	RVP	RAIN WATER PIPE
CL	COVER LEVEL	L	LIGHT	RV	RETAINING WALL
E	EARTH POINT	LP	LAMPPOST	SL	SUMP LEVEL
ECP	ELECTRICITY CABLE PIT	MH	MANHOLE	SP	SOIL PIPE
EP	ELECTRICITY POLE	Mer	SERVICE MARKER	SV	SLUICE VALVE
FH	FIRE HYDRANT	NB	NOTICE BOARD	Tow	TOP OF WALL LEVEL
FL	FLOOR LEVEL	NFI	NO FURTHER INFORMATION	TIC	TELEPHONE INSPECTION COVER
G	GULLY	ODSM	ORDNANCE SURVEY BENCH MARK	TP	TELEPHONE POLE
GC	GAS COCK	P	POST OR PILLAR	UTL	UNABLE TO LIFT
GV	GAS VALVE	RE	RODDING EYE	VP	VENT PIPE
IC	INSPECTION COVER	RG	ROAD GULLY	VO	WASH OUT
IL	INVERT LEVEL	RS	ROAD SIGN	WM	WATER METER

APPENDIX B



PRPOPOSED SCHEME PLANS

Gravesham Borough Council

River Thames

CLIFTON MARINE PARADE

Ellandaye House

PIER ROAD

Warren Hastings Court

AMENITY COURTYARD
(for existing flats)

PARKING COURTYARD
(reconfigured to provide for
12 No parking spaces)

Fire escape door
at ground floor

Means of escape from fire
exit door and fire corridor
connecting flats A-D

pavement

Retaining wall to upper elevated
level overlooking Clifton Marine Parade

Existing Traffic Regulation Order (TRO)
to be amended to provide for 4 No
unallocated on-street parking bays

4 No parking spaces

Entrance
flats C-D

Entrance
flats A-B

4

52

G3

Proposed Site Layout Plan
1:250 @ A3

0 2 4 6 8 10
Metres (1:250)



Rev: Reason: Date:
Client:
BILLINGS GROUP
Project:
WARREN HASTINGS COURT, CLIFTON MARINE
PARADE, GRAVESEND, KENT, DA11 9NB
Title:
PROPOSED SITE LAYOUT PLAN
Drawing No: Rev: Scale: Date:
DHA/14980/10 1:250 OCT 2021



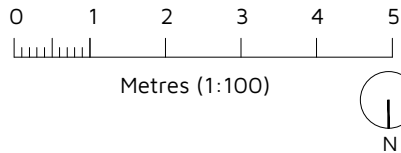
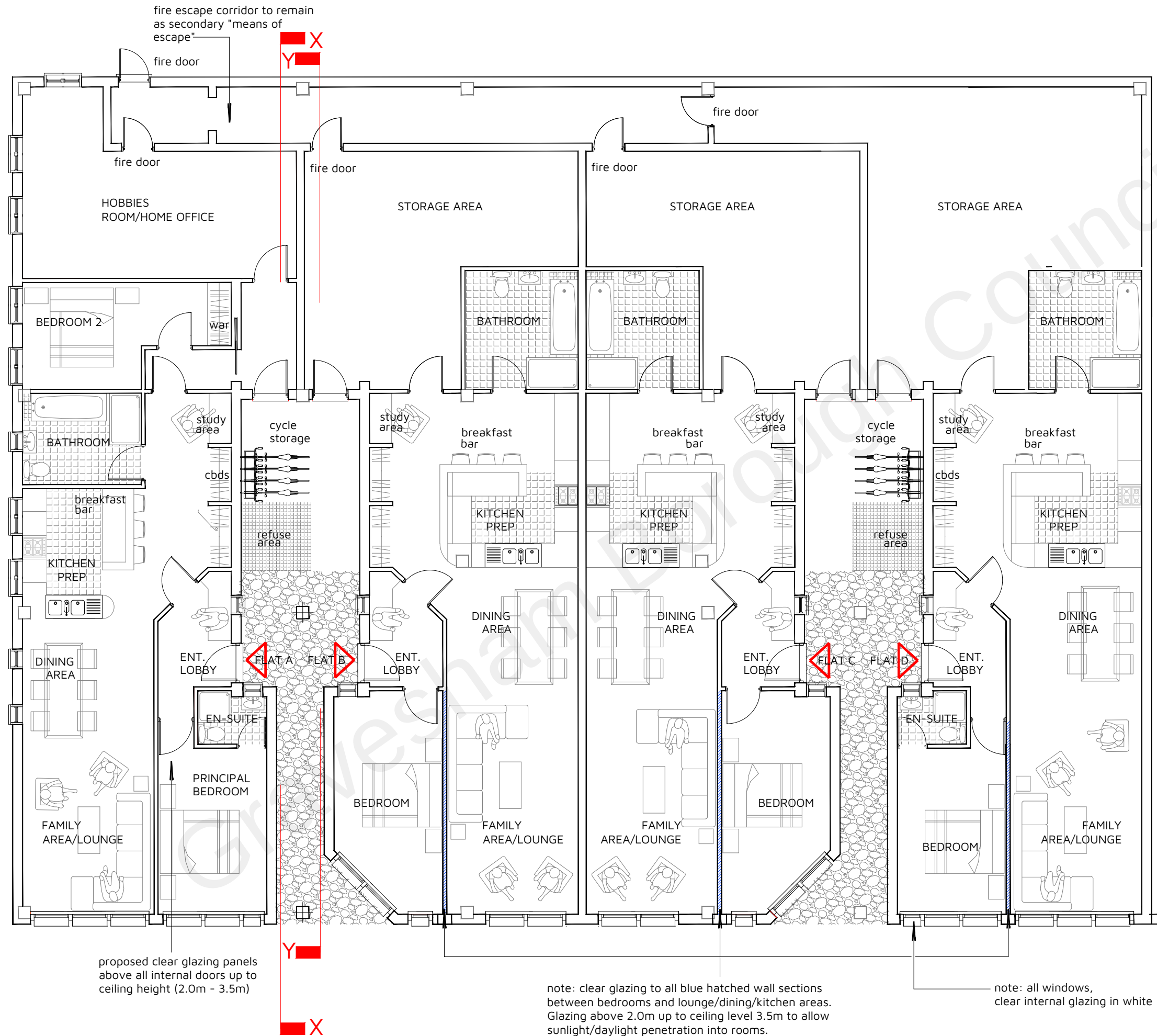
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CAD Reference: DHA_14980_WARREN HASTINGS COURT_PFS10A3



FLOOR SPACE ACCOMMODATION
SCHEDULE G.I.A. (gross internal areas)

UNIT A....120 sq m (2 bed dwelling)
UNIT B....115 sq m (1 bed dwelling)
UNIT C....115 sq m (1 bed dwelling)
UNIT D....133 sq m (1 bed dwelling)

1 No car space per dwelling with
additional 2 No shared visitor spaces
to designated car park at upper level

Rev: Reason: Date:
Client:
BILLINGS GROUP
Project:
WARREN HASTINGS COURT, CLIFTON MARINE
PARADE, GRAVESEND, KENT, DA11 9NB
Title:
BUILDING CONVERSION
PROPOSED GROUND FLOOR PLAN
Drawing No: Rev: Scale: Date:
DHA/14980/11 1:100 OCT 2021



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Maidstone, Kent, ME14 3EN
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Proposed Ground Floor Plan
1:100 @ A3

APPENDIX C



ENVIRONMENT AGENCY PRODUCT 4 REPORT

Gravesham Borough Council

Product 4 (Detailed Flood Risk) for: Site on Pier Road, Gravesend DA11 9AL
Requested by: Chris Smoker, DHA Transport
Reference: KSL 218799 AC
Date: 03 August 2021

Contents

- Flood Map for Planning (Rivers and Sea)
- Flood Map Extract
- Thames Estuary 2100 (TE2100)
- Thames Tidal Downriver Breach Inundation Modelling 2018
- Thames Tidal Downriver Breach Inundation Modelling Map
- Site Node Locations Map
- Defence Details
- Recorded Flood Events Data
- Recorded Flood Events Outlines Map
- Additional Information

The information provided is based on the best data available as of the date of this letter.

You may feel it is appropriate to contact our office at regular intervals, to check whether any amendments/ improvements to the data for this location have been made. Should you re-contact us after a period of time, please quote the above reference in order to help us deal with your query.

Please refer to the [Open Government Licence](#) which explains the permitted use of this information.

Flood Map for Planning (Rivers and Sea)

The Flood Map:

Our Flood Map shows the natural floodplain for areas at risk from river and tidal flooding. The floodplain is specifically mapped ignoring the presence and effect of defences (including any tidal barriers). Although flood defences reduce the risk of flooding they cannot completely remove that risk as they may be over topped or breached during a flood event.

The Flood Map indicates areas with a 1% (0.5% in tidal areas), Annual Exceedance Probability (AEP) - the probability of a flood of a particular magnitude, or greater, occurring in any given year, and a 0.1% AEP of flooding from rivers and/or the sea in any given year. In addition, the map also shows the location of some flood defences and the areas that benefit from them.

The Flood Map is intended to act as a guide to indicate the potential risk of flooding. When producing it we use the best data available to us at the time and also take into account historic flooding and local knowledge. The Flood Map is updated on a quarterly basis to account for any amendments required. These amendments are then displayed on the internet at <https://www.gov.uk/check-flood-risk>

At this Site:

The Flood Map shows that part of this site lies within the outline of Flood Zone 3. This zone comprises land assessed as having a 0.5% (1 in 200) or greater annual probability of tidal flooding.

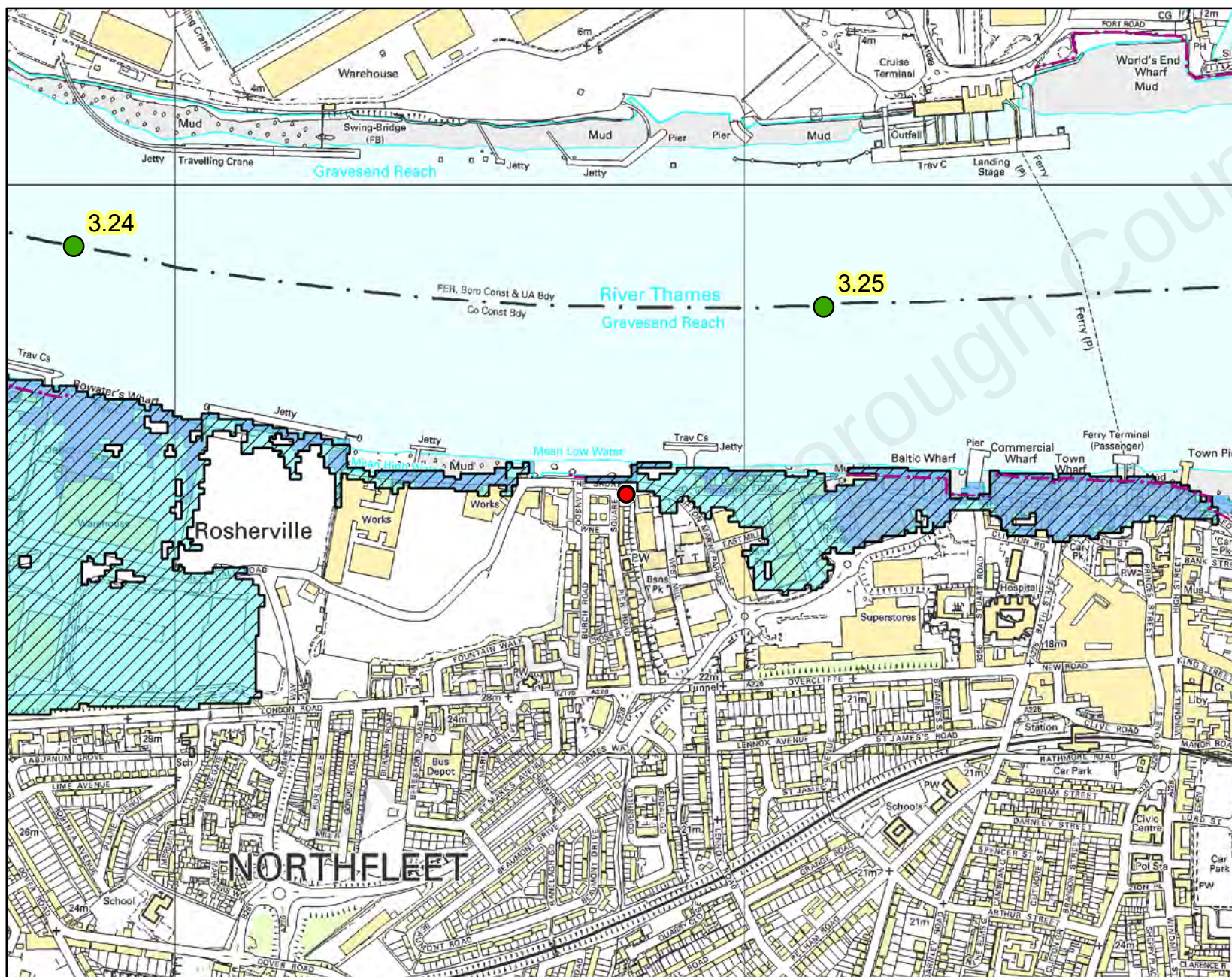
The map also shows that part of this site is not within the current 'Extreme Flood Outline'. According to the Flood Map, which provides a general estimate of the likelihood of flooding across England & Wales, this site is shown to have less than 0.1% (1 in 1000) chance of flooding in any year from rivers and/or the sea.

Enclosed is an extract of our Flood Map which shows this information for your area.

Method of production

The Flood Map at this location has been derived using detailed modelling of the tidal River Thames through the North Kent Coastal Modelling study completed in 2018 by JBA Consulting.

Detailed FRA/FCA Map centred on DA11 9AL created 03 August 2021 [Ref: KSL 218799 AC]



Scale 1: 10,000



Legend

- Site Location
- TE2100 Model Nodes
- Main Rivers
- Flood Map - Defences
- Flood Map - Flood Storage Areas
- Areas Benefiting from Flood Defences
- Flood Map - Flood Zone 3
- Flood Map - Flood Zone 2

Flood Map for Planning (assuming no defences)

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

- from the sea with a 0.5% or greater chance of occurring each year
- or from a river with a 1% or greater chance of occurring each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 0.1% chance of occurring each year.

Thames Estuary 2100 (TE2100)

You have requested in-channel flood levels for the tidal river Thames. These have been taken from the Thames Estuary 2100 study completed by HR Wallingford in 2008. The modelled node closest to your site is **3.25**; the locations of nearby nodes are also shown on the enclosed map.

Details about the TE2100 plan

The Plan sets out how the Environment Agency and our partners can work together to manage tidal flood risk, from now until the end of the century. The Plan covers the Thames Estuary from Teddington in the west to the mouth of the estuary at Shoeburyness (north bank) and Sheerness (south bank) in the east. It is an adaptive plan for managing the estuary, including the tidal defence system, until 2100 so that current standards of flood protection are maintained or improved taking into account climate change effects e.g. sea level rise. The Plan has 3 phases of activity:

- Until 2035 – maintain and improve current defences, safeguard areas required for future improvements, and monitor climate change indicators.
- 2035-2050 – raise existing walls, defences & smaller barriers whilst reshaping the riverside environment.
- 2050-2100 – determine and implement an option for the future of the Thames Barrier, and adapt other defences as required to work alongside this to protect the estuary.

The Thames Estuary 2100 Plan can be found at: <https://www.gov.uk/government/publications/thamesestuary-2100-te2100>

Details about the TE2100 in-channel levels

The TE2100 in-channel levels take into account operation of the Thames Barrier when considering future levels. The Thames Barrier requires regular maintenance and with additional closures the opportunity for maintenance will be reduced. When this happens, river levels – for which the Barrier would normally shut for the 2008 epoch – will have to be allowed through to ensure that the barrier is not shut too often. For this reason, levels upriver of the barrier will increase and the tidal walls will need to be raised to match.

For further information about the Thames Barrier please visit our website at:

<https://www.gov.uk/the-thames-barrier>

TE2100 2008 levels:

Levels downriver of the Thames Barrier are 0.1% AEP (1 in 1000) and levels upriver are the highest levels permitted by the Thames Barrier, described as the Maximum Likely Water Levels (MLWLs). The defence levels (left defence, right defence) are the minimum levels to which the defences should be built.

Location	Node	Easting	Northing	Extreme water level (m)	Left defence (m)	Right defence (m)	Allow for future defence raising to a level of...	
							Left Bank (m)	Right Bank (m)
Tilbury lock	3.24	562822	174891	5.83	6.50	6.73	8.00	8.00
	3.25	564140	174785	5.81	6.95	6.87	8.00	8.00
Gravesend	3.26	565310	174817	5.78	6.65	6.75	8.00	8.00

TE2100 climate change levels:

Location	Node	Easting	Northing	1000-year design water levels					
				2000	2040	2070	2100	2120	2170
Tilbury lock	3.24	562822	174891	5.83	6.04	6.19	6.49	6.69	7.18
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Gravesend	3.26	565310	174817	5.78	5.99	6.14	6.44	6.65	7.19

Thames Tidal Downriver Breach Inundation Modelling - 2018

The table below displays site-specific modelled flood levels at your site. These have been taken from the Downriver Breach Inundation Modelling Study 2018 completed by Atkins Ltd. in May 2018.

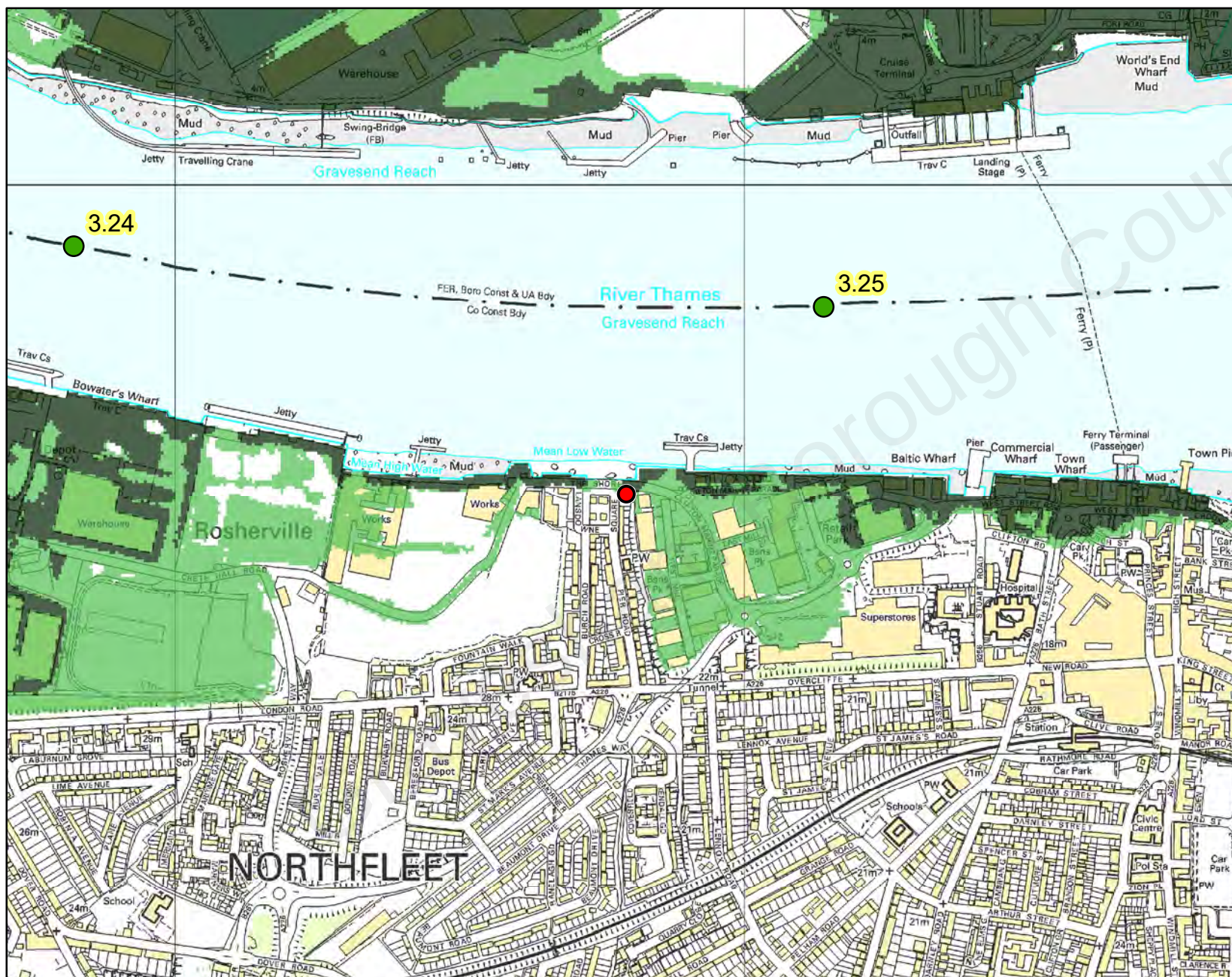
We have developed a modelling approach where all downriver breach locations along the Thames are equitably modelled, to ensure a consistent approach across London. This modelling simulates continuous tidal breaches along the entire extent of the Thames between the Thames Barrier and east of Gravesend on the south bank and east of Tilbury on the north bank. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width.

Based on the 2008 TE2100 in-channel levels, the 0.5% (1 in 200 year) and 0.1% (1 in 1000 year) annual probability of exceedance tidal events were modelled for all breach locations downriver of the Thames Barrier. These were modelled for the 2014 year epoch (current year), as well as 2115 epoch which include allowances for climate change.

This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within London.

Node	National Grid Reference		Modelled levels in mAODN for 0.5% AEP		Modelled levels in mAODN for 0.1% AEP	
	Easting	Northing	2014	2115	2014	2115
1	563808	174446	Nil return	Nil return	Nil return	6.40
2	563812	174462	5.37	6.20	5.73	6.46
3	563817	174476	5.37	6.23	5.74	6.50
4	563798	174471	5.37	6.23	5.74	6.53
5	563776	174468	Nil return	6.23	5.74	6.53
6	563753	174471	Nil return	Nil return	Nil return	6.61
7	563769	174451	Nil return	Nil return	Nil return	Nil return
8	563816	174426	Nil return	6.17	Nil return	6.46

Downriver Breach Modelling Map centred on DA11 9AL created 03 August 2021 [Ref: KSL 218799 AC]



Scale 1: 10,000



Legend

- Site Location
- TE2100 Model Nodes
- Main Rivers

Downriver 0.5% AEP Outlines

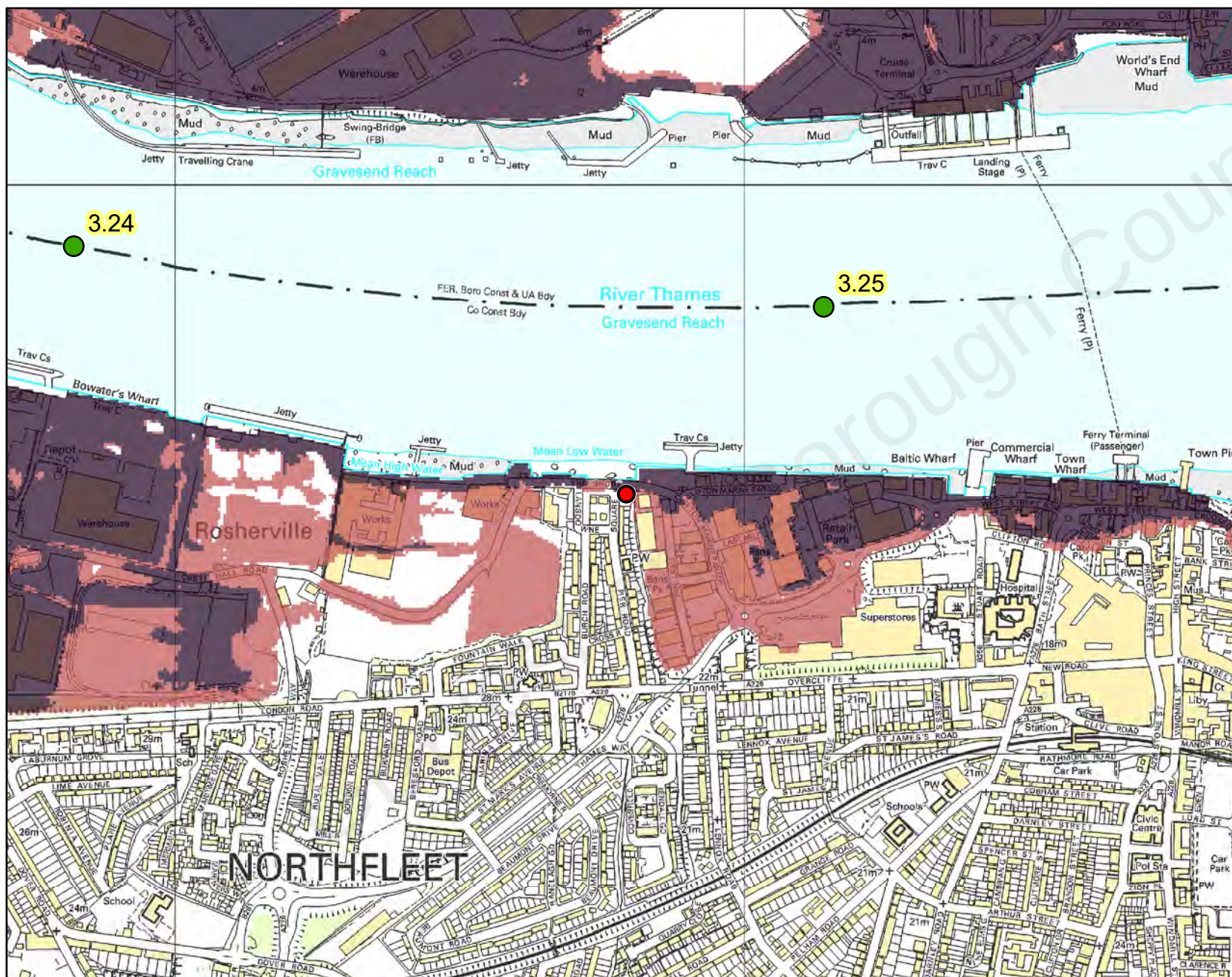
Epoch

- 2014 (Current year)
- 2115

Thames Tidal Downriver Breach Inundation Modelling 2018

A modelled representation of all tidal breach locations along the Thames from the Thames Barrier to Gravesend, based on low floodplain topography. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width. The modelling is based on the 2008 TE2100 in-channel levels, with an allowance for climate change for epoch 2115.

Downriver Breach Modelling Map centred on DA11 9AL created 03 August 2021 [Ref: KSL 218799 AC]



Scale 1: 10,000



Legend

- Site Location
- TE2100 Model Nodes
- Main Rivers

Downriver 0.1% AEP Outlines

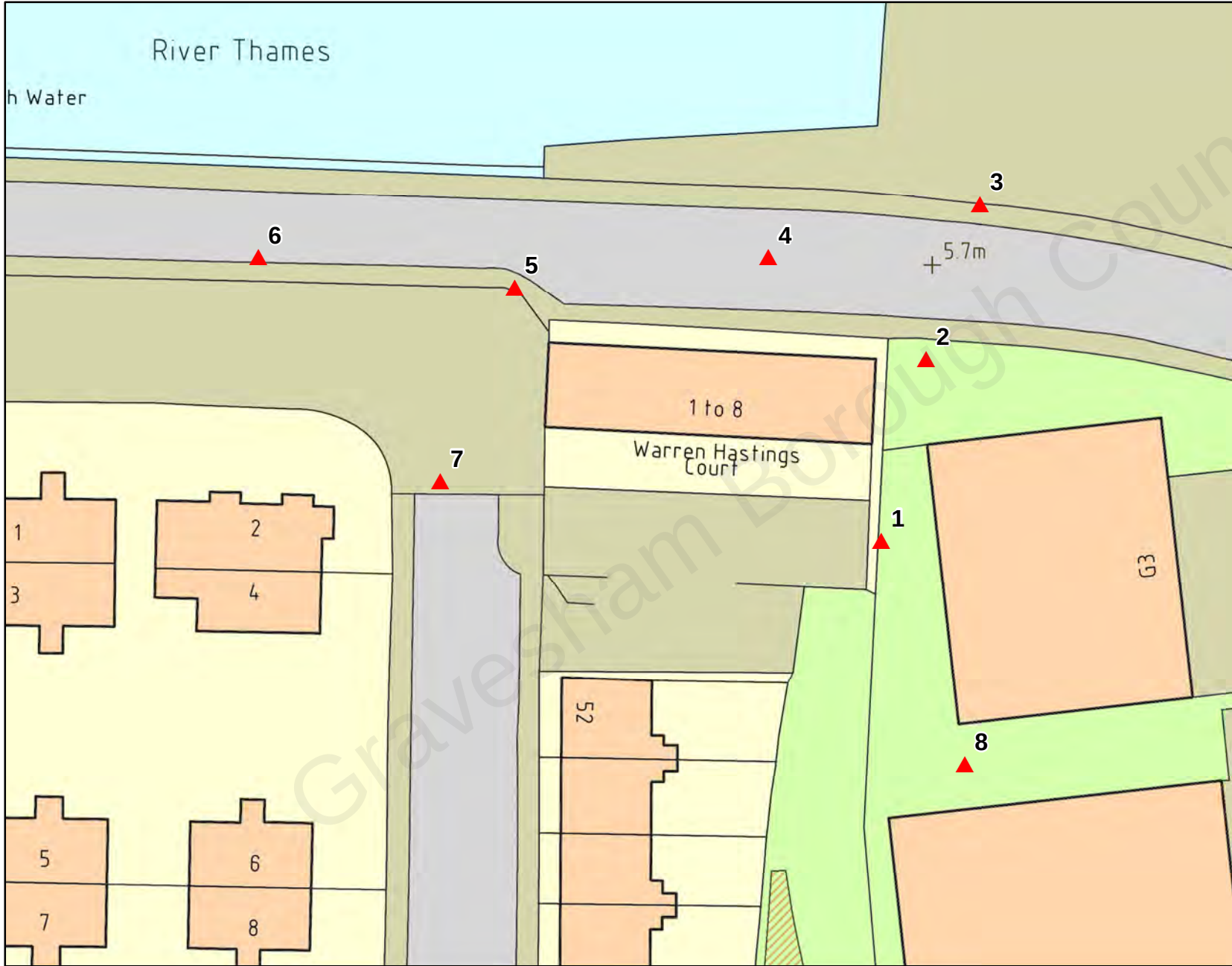
Epoch

- 2014 (Current year)
- 2115

Thames Tidal Downriver Breach Inundation Modelling 2018

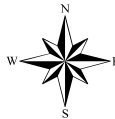
A modelled representation of all tidal breach locations along the Thames from the Thames Barrier to Gravesend, based on low floodplain topography. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width. The modelling is based on the 2008 TE2100 in-channel levels, with an allowance for climate change for epoch 2115.

Node Location Map centred on DA11 9AL created 03 August 2021 [Ref: KSL 218799 AC]



Environment
Agency

Scale 1: 500



Legend

▲ Node Point Locations

Defence Details

The design standard of protection of the flood defences in this area of the Thames is 0.1% AEP; they are designed to defend London up to a 1 in 1000 year **tidal** flood event. The defences are all raised, man-made and privately owned. It is the riparian owners' responsibility to ensure that they are maintained to a crest level of 6.87 m AODN (the Statutory Flood Defence Level in this reach of the Thames).

Defence 1 Asset type – wall Description – 29.69m in length Location – Along The Shore road, within marked boundary of site Maintainer – Environment Agency Asset protection type – tidal Condition – 2 (good)	Defence 2 Asset type – wall Description – 65.33m in length Location – Along The Shore road, partially within marked boundary of site Maintainer – Local Authority Asset protection type – Tidal Condition – 2 (good)	Defence 3 Asset type – wall Description – 179.36m in length Location – starting from The Shore road and continuing around Imperial Wharf Maintainer – Local Authority Asset protection type – Tidal Condition – 2 (good)
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For more information on your rights and responsibilities as a riparian owner, please see our document 'Living on the edge' found on our website at:

<https://www.gov.uk/government/publications/riverside-ownership-rights-and-responsibilities>

Areas Benefiting from Flood Defences

This site is within an area benefiting from flood defences, as shown on the enclosed extract of our Flood Map. Areas benefiting from flood defences are defined as those areas which benefit from formal flood defences specifically in the event of flooding from rivers with a 1% (1 in 100) chance in any given year, or flooding from the sea with a 0.5% (1 in 200) chance in any given year.

If the defences were not there, these areas would be flooded. An area of land may benefit from the presence of a flood defence even if the defence has overtopped, if the presence of the defence means that the flood water does not extend as far as it would if the defence were not there.

Recorded Flood Events Data

Flood Event Data

We do not hold records of historic flood events from rivers and/or the sea affecting the area local to this site. However, please be aware that this does not necessarily mean that flooding has not occurred here in the past, as our records are not comprehensive.

Due to the fact that our records are not comprehensive, we would advise that you make further enquiries locally with specific reference to flooding at this location. You should consider contacting the relevant Local Planning Authority and/or water/sewerage undertaker for the area.

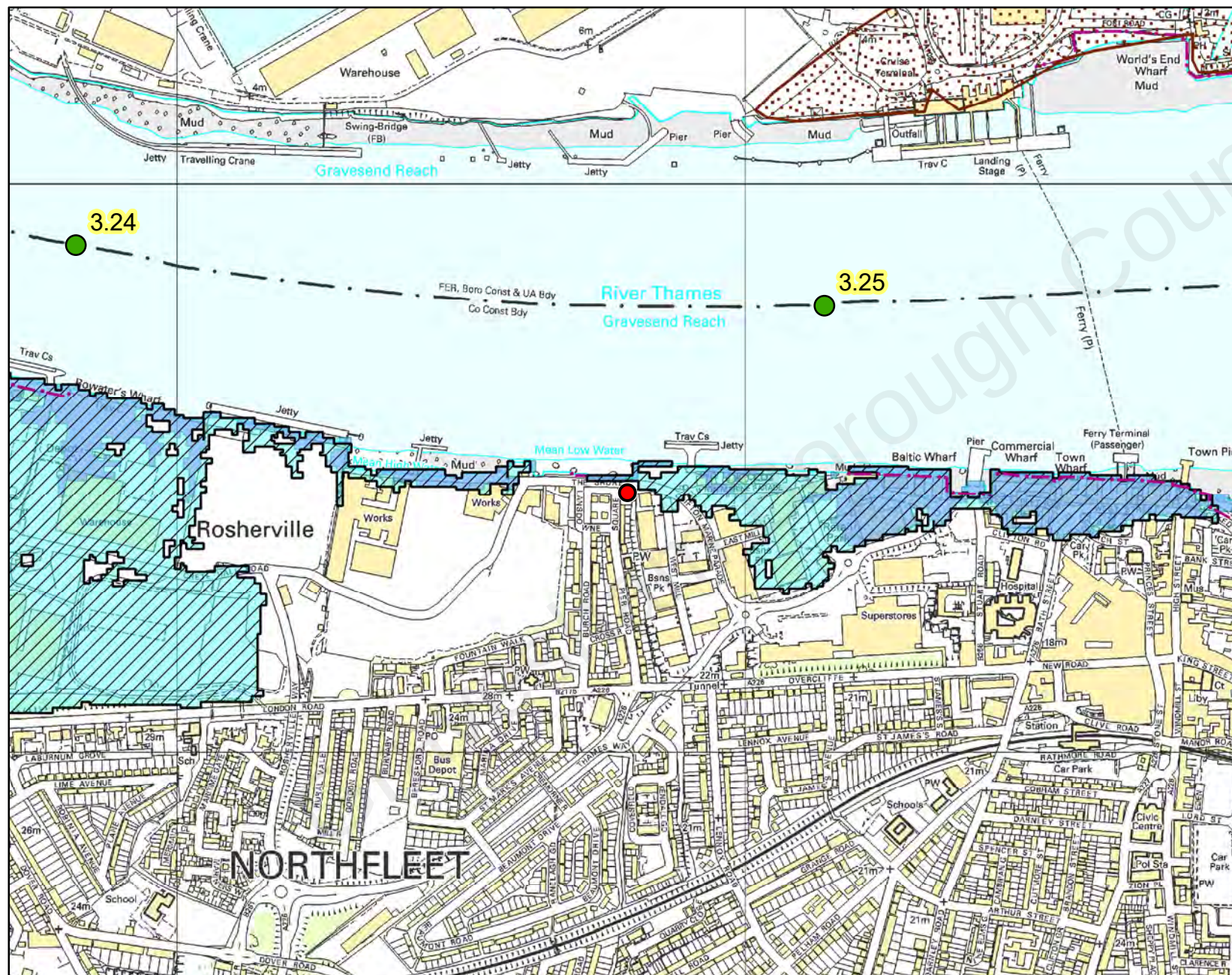
We map flooding to land, not individual properties. Our historic flood event record outlines are an indication of the geographical extent of an observed flood event. Our historic flood event outlines do not give any indication of flood levels for individual properties. They also do not imply that any property within the outline has flooded internally.

Please be aware that flooding can come from different sources. Examples of these are:

- from rivers or the sea;
- surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system);
- overflowing or backing up of sewer or drainage systems which have been overwhelmed,
- groundwater rising up from underground aquifers

Currently the Environment Agency can only supply flood risk data relating to the chance of flooding from rivers or the sea. However you should be aware that in recent years, there has been an increase in flood damage caused by surface water flooding and drainage systems that have been overwhelmed.

Historic Flood Map centred on DA11 9AL created 03 August 2021 [Ref: KSL 218799 AC]



Scale 1: 10,000



Legend

-  Site Location
-  TE2100 Model Nodes
-  Main Rivers
-  Flood Map - Defences
-  Flood Map - Flood Storage Areas
-  Areas Benefiting from Flood Defences
-  Flood Map - Flood Zone 3
-  Flood Map - Flood Zone 2
-  Jan 1953 Flood Outline

**Flood Map for Planning
(assuming no defences)**

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

- from the sea with a 0.5% or greater chance of occurring each year
- or from a river with a 1% or greater chance of occurring each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 0.1% chance of occurring each year.

Additional Information

Information Warning - OS background mapping

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Planning advice and guidance

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

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

Complete the form in the link and email back to kslplanning@environment-agency.gov.uk

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

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

Flood Risk Assessments guidance

Flood risk standing advice for applicants

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

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

<http://planningguidance.planningportal.gov.uk/>

<https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>

<https://www.gov.uk/guidance/flood-risk-and-coastal-change>

You should also consult the Strategic Flood Risk Assessment and flood risk local plan policies produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or overland runoff. You should discuss surface water management with your Lead Local Flood Authority.
3. Where a planning application requires a FRA and this is not submitted or deficient, the Environment Agency may well raise an objection due to insufficient information

Surface Water

We have provided two national Surface Water maps, under our Strategic Overview for flooding, to your Lead Local Flood Authority who are responsible for local flood risk (i.e. surface runoff, ground water and ordinary watercourse), which alongside their existing local information will help them in determining what best represents surface water flood risk in your area.

Your Lead Local Flood Authority have reviewed these and determined what it believes best represents surface water flood risk. You should therefore contact this authority so they can provide you with the most up to date information about surface water flood risk in your area.

You may also wish to consider contacting the appropriate relevant Local Planning Authority and/or water/sewerage undertaker for the area. They may be able to provide some knowledge on the risk of flooding from other sources. We are working with these organisations to improve knowledge and understanding of surface water flooding.