Caroline Latham

Replacement Dwelling
Off Carr Lane
East Lound
North Lincolnshire

Flood Risk Assessment
Prepared by EWE Associates Ltd
Final Report RevC November 2025

EWE Associates Ltd
7 Waveney Close
Burton Upon Stather
Scunthorpe
North Lincolnshire
DN15 9DT
t: 01724 721099
M: 07875 972270
e: lea.favill@eweassociates.com

CLIENT DETAILS

Caroline Latham
East Lound
North Lincolnshire

CONTRACT

This report describes work commissioned by Caroline Latham following written instruction during January 2025. Carrie Morrell representative for the contract was Mr Danny Snow of Cadworx Ltd. Lea Favill of EWE Associates Ltd carried out the work.

Date: 27th November 2025

Prepared by: …… [redacted] …… Lea Favill
Director

REVISION HISTORY

Draft Report Rev0 issued 11th February 2025 - 1No copy issued to Danny Snow
Final Report RevA issued 3rd March 2025 - 1No copy issued to Danny Snow
Final Report RevB issued 29th April 2025 - 1No copy issued to Danny Snow
Final Report RevC issued 27th November 2025 - 1No copy issued to Danny Snow

CONTENTS

LIST OF TABLES

1. INTRODUCTION

Terms of Reference

This report was commissioned by Caroline Latham to support a planning application for a replacement dwelling off Carr Lane near East Lound. The site is located to the west of Carr Lane to the south of East Lound. The location of the site is shown on Table 2-1.

The development site lies within Zone 3 of the Environment Agency Flood Map (version 2.8.2), being the zone with risk of 1 in 200 year (0.5% Annual Exceedance Probability) or greater for river and tidal/coastal flooding. The development site is within an existing developed area and is less than 1 hectare.

It is usual for the Agency to raise an objection to development applications within the floodplain or Zone 2 or 3 of the flood map until the question of flood risk has been properly evaluated. The Agency will also object to developments where the total site area is in excess of 1 hectare until suitable consideration has been given to surface water runoff.

Approach to the Assessment

As there are four sources of flood risk which require initial consideration – River Trent, Warping Drain, local watercourses and onsite surface water runoff – it is necessary to determine flood water levels at the site for the desired return periods emanating from these sources. Consideration has also been given to the site flooding from either overland flow or ponding of localised rainfall within the site.

The closest tidal watercourse is the River Trent which is 2.5km to the east of the site. The Environment Agency provided the flood maps for both overtopping and breach at the development site. This data will be used to assess the flood risk at the site from the tidal River Trent.

The Warping Drain is 1km to the south of the site. The watercourses form part of the complex Isle of Axholme drainage system which eventually discharges into the River Trent at Owston Ferry to the east of the site. The Environment Agency provided the flood maps for the overtopping events at the development site. This data will be used to assess the flood risk at the site from the Warping Drain.

There is a small watercourse directly to the south and north of the site which discharges into the network of IDB drains located adjacent to Carr Lane. There are no estimated or historical flood level for these watercourses in line with the site.

The proposed development will not increase the paved and roofed area within the site. The site currently has approval for a Class Q Dwelling. Subsequently, there will be no increase in runoff from the site following the development and no further consideration has been given to this mechanism.

A walk over of the site was conducted by Mr Lea Favill, a senior river engineer during February 2025; during the visit a photograph survey of the site was undertaken. A spot level survey of the site was provided by the client. These surveyed levels have been utilised within this report.

The requirements for flood risk assessments are generally as set out in National Planning Policy Framework (NPPF). The detail and complexity of the study required should be appropriate to the scale and potential impact of the development. For the purposes of this study, the following have been considered: -

- Available information on historical flooding in the area.
- Site level information.
- Details of structures, which may influence hydraulics of the watercourse and consideration of the effect of blockage of structures.
- Estimates of design levels, equivalent to a 200-year (coastal/tidal) and a 100-year (fluvial) return period flood event.
- Allowances for increased flows resulting from the effects of climate change.
- Allowances for sea level rise resulting from the effects of climate change.

Assess the existing runoff characteristics and the potential impact the proposed development will have on the runoff.

Further guidance is also provided in the CIRIA Research Project 624 “Development and Flood Risk: Guidance for the Construction Industry”.

Application of Sequential & Exceptions Test

The development site lies partially within Zone 3 of the Environment Agency Flood Map (version 2.8.2), being the zone with risk of 1 in 200 year (0.5% AEP) or greater for tidal/coastal flooding. The proposed development is residential, as such considered to be more vulnerable.

Table 1-1: Flood Risk Vulnerability and Flood Zone 'Compatibility'

Flood Risk Vulnerability classification		Essential Infrastructure	Water compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	×	**Exception Test required**	✓
	Zone 3b	Exception Test required	✓	×	×	×

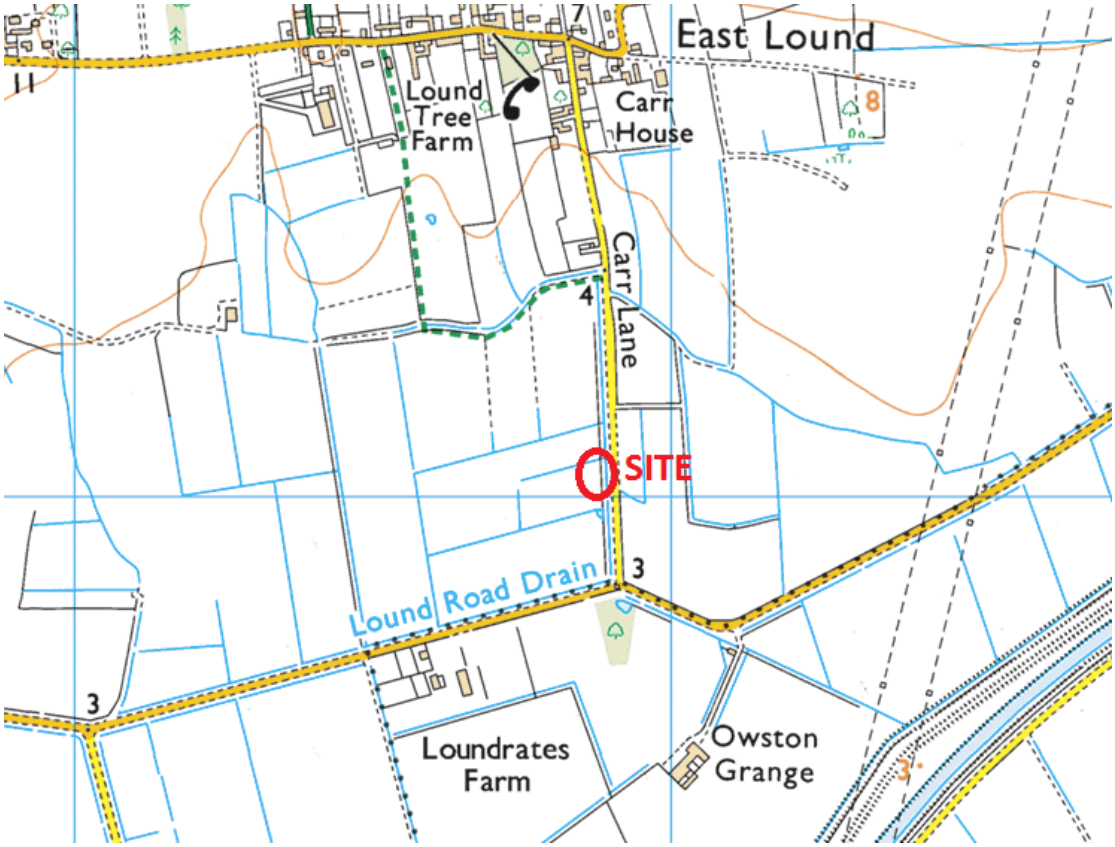
✓ Development is appropriate

× Development should not be permitted

2. DETAILS OF THE SITE

Site Location

Table 2-1: Location Plan



Site Details

Table 2-2: Site Details	
Site Name	Off Carr Lane East Lound
Existing Land Use	Approved Class Q Dwelling
Proposed Development	Residential
Grid Reference	SK7886199418
County	North Lincolnshire
Local Planning Authority	North Lincolnshire Council
Internal Drainage Board	Isle of Axholme IDB
Others	Not Applicable
Post Code	DN9 2LT

Site Description

The proposed development site has planning approval for a Class Q Dwelling with a roofed area of less than 170m². An aerial photograph of the existing site is provided below. The land within the site boundary is generally at a level of 2.7mOD. The existing site plan is provided at Appendix A.

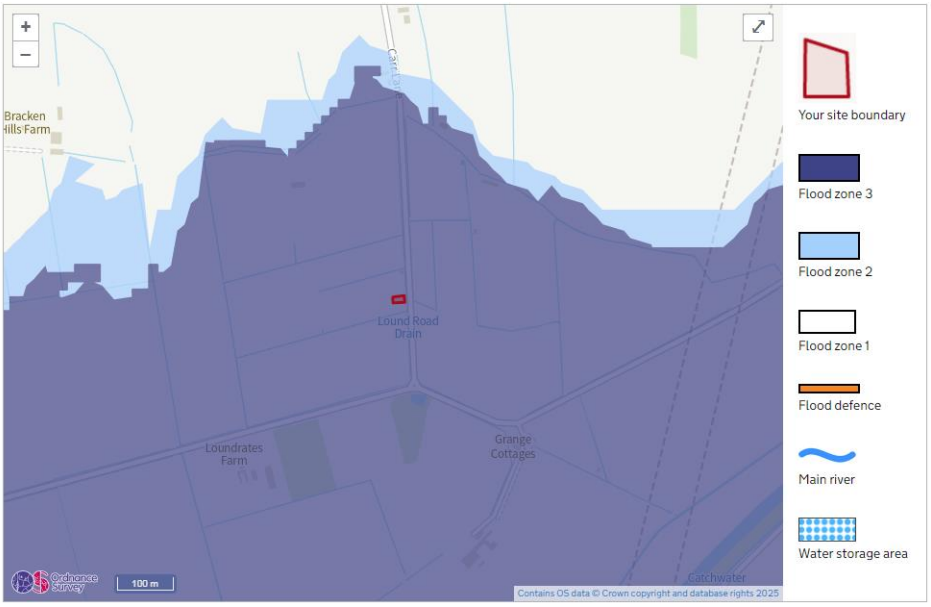
The site is located to the south of East Lound in North Lincolnshire. The area local to the site is generally agricultural with several small holdings and farms close to the site.

The proposal is to provide a new residential dwelling. The development will not increase the roofed or paved area and therefore the impermeable area will not be increased. The proposed layout plan is provided at Appendix B of this report.

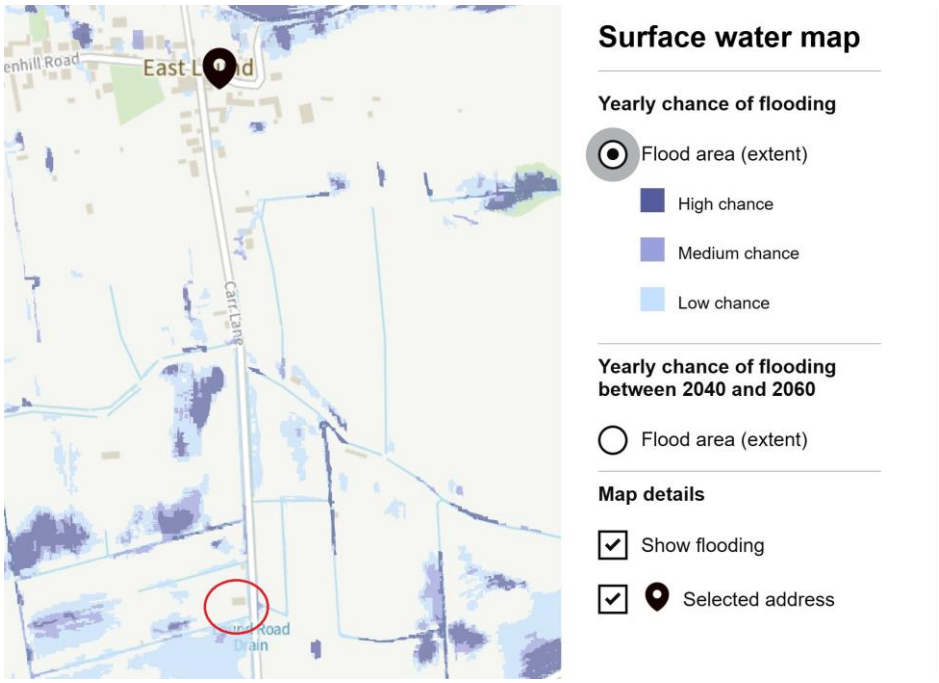
Site Photographs

3. INITIAL ASSESSMENT

Environment Agency Flood Map



Environment Agency Surface Water Flood Map 100 year



Past Flooding History

A search on the British Hydrological Society Chronology of British Hydrological Events website[1] found no records of past flooding within the East Lound area close to the site.

Undertaking an internet-based search for flooding in the area provided no further information.

SFRA Flooding History

The SFRA contained no references to the site being flooded.

Environment Agency Flooding History

The Environment Agency provided no further information.

Environment Agency Reservoir Flood Risk

The Environment Agency reservoir risk map shows that the site and local area are not located in an area which could be affected by a reservoir failure. As such, the probability of a flooding is extremely low.

Environment Agency Surface Water Flood Risk

The Environment Agency surface water flood risk map shows the majority of the site is very low risk.

Overland Flow & Ponding

There is no higher ground adjacent to the site which could promote overland flow of water across the site from the residential area. Consequently, no further consideration will be given to this mechanism.

There are no depressed areas within the site which could encourage ponding, therefore, this flood mechanism has not been considered further.

Groundwater Flooding

Information on groundwater flooding is limited within the area. The SFRA makes no comment regards the potential for ground water flooding in the district. As such, risk from ground water flooding is low.

[1] http://www.dundee.ac.uk/geography/cbhe/

Sewer Flooding

Severn Trent Water is the statutory water undertaker and is responsible for the public sewer systems within the area. There are no existing surface water or foul sewers within the development site.

Severn Trent Water maintains a register of historical sewer flooding events (DG5 Register) within the area. There are no reported incidents close to the site. The SFRA provided no further information.

Possible Flooding Mechanisms

As there is are three sources of flood risk requiring more detailed consideration – River Trent, Warping Drain and Local Watercourse – it is necessary to determine flood water levels at the site for the desired return periods emanating from these sources.

The River Trent is located 2.5km east of the site, however, consideration will be given to the impact of overtopping and breach events on the proposed development from the River Trent.

The Warping Drain is located 1km to the south of the site, consideration will be given to the impact of overtopping events on the proposed development from the Warping Drain.

There is a small watercourse directly to the south and north of the site which discharges into the network of IDB drains located adjacent to Carr Lane, consideration will be given to the impact of overtopping events on the proposed development from the watercourse.

4. FLOOD RISK ASSESSMENT

Requirements of the Environment Agency

The Environment Agency, as part of its development control procedures, generally require finished floor levels to be set above the 1% AEP plus climate change flood water level at the site. The development is residential in nature, as such, it is considered that access and egress from the development site will be essential during times of extreme floods.

River Trent

The main channel of the River Trent is located approximately 2.5km to the east of the site. The River Trent is defended by earth embankments and flood walls in line with the site. At this point the River Trent is tidal. As such the current design standard for the River Trent is considered to be the 1 in 200 year flood event. However, consideration will need to be given to the impact of climate change over the design life of the development.

The Environment Agency has provided hazard mapping of both the critical design events for a breach of the defences and overtopping of the defences. As the site is a considerable distance from the River Trent it is likely that any flooding due to overtopping or breach will inundate the existing network of watercourse in order to flood the area. Therefore, due to the presence of nearby main river watercourses it is envisaged that flooding will initially occur from the direction of the Warping Drain. The flood data provide by the Environment Agency is provided at Appendix C of this report.

1 in 100 year fluvial flood event within the River Trent

The Environment Agency has provided hazard mapping for the 1 in 200 year over topping flood event. As can be seen from the hazard map the site remains dry during this flood event.

Increase in estimated flood level due to Climate Change

NPPF/PPS25 states that *'…Flood risk assessment should be carried out to the appropriate degree at all levels of the planning process, to assess the risks of all forms of flooding to and from development taking climate change into account. The future users of the development must not be placed in danger from flood hazards and should remain safe throughout the lifetime of the plan or proposed development and land use*.'

As the proposed development is for a residential land use, consideration has therefore been given to take into account the potential effects of climate change over the next 100 years in accordance with NPPF/PPS25. The Environment Agency provided an estimated 1 in 100 year plus climate change flood level in line with the site.

The Environment Agency has provided hazard mapping for the 1 in 100 year plus climate change over topping flood event. These included the 29%, 39% and 62% climate change increases. As can be seen from the hazard map the site remains dry during these flood events. The following flood levels have been extracted from the flood level data close to the site.

- 100yr+CC39% = 2.47mOD
- 100yr+CC62% = 2.63mOD

1 in 1,000 year flood event within the River Trent

The Environment Agency has provided hazard mapping for the 1 in 1,000 year over topping flood event. The site is shown to be flooded during this event to a level of 2.62mOD. The building remans dry during this flood event.

1 in 200 year plus climate change breach event within the River Trent

The Environment Agency did not provide a breach hazard mapping for the area local to the site. However, due to the distance and obstructions the flood depth is unlikely to exceed the overtopping scenarios.

River Trent undefended scenario

The Environment Agency has provided hazard mapping for the 1 in 100 year and 1 in 1,000 year undefended flood events. This scenario assumes that all of the River Trent flood defences have been removed which includes flood embankments, flood walls and storage areas. The site is shown to be flooded to a level of 3.48mOD during a 1 in 100 year event and 4.13mOD during a 1 in 1,000 year event.

Warping Drain

The main channel of the Warping Drain is located 1km south of the site. The Environment Agency did not provide any flood information for the drain. However, it is considered that the River Trent will provided the greatest flood levels at the site.

Local Watercourse

There are small watercourses to the north and south of the site which discharge east into the IDB drains located either sid of Carr Lane which flow south into the Warping Drain. The surface water flood maps show that the whole of the site remains dry during the 1 in 100 year and 1 in 1,000 year events.

5. MITIGATION MEASURES

Raising Floor Levels/Land Raising

The land within the site boundary is generally at 2.7mOD. The River Trent, Waste Drain and local watercourse flood mapping shows the site remains dry during defended scenarios. As such, the flood risk from tidal, fluvial, and ordinary watercourses is considered to be low. The maximum flood level adjacent to the site has been estimated at 2.63mOD during the 1 in 100 year plus climate change 62% event.

The critical flood level for the area has been quoted by the Environment Agency as 3.8mOD.

It is proposed that the habitable ground floor level is elevated to 4.1mOD at the request of the Environment Agency.

Emergency Access & Egress

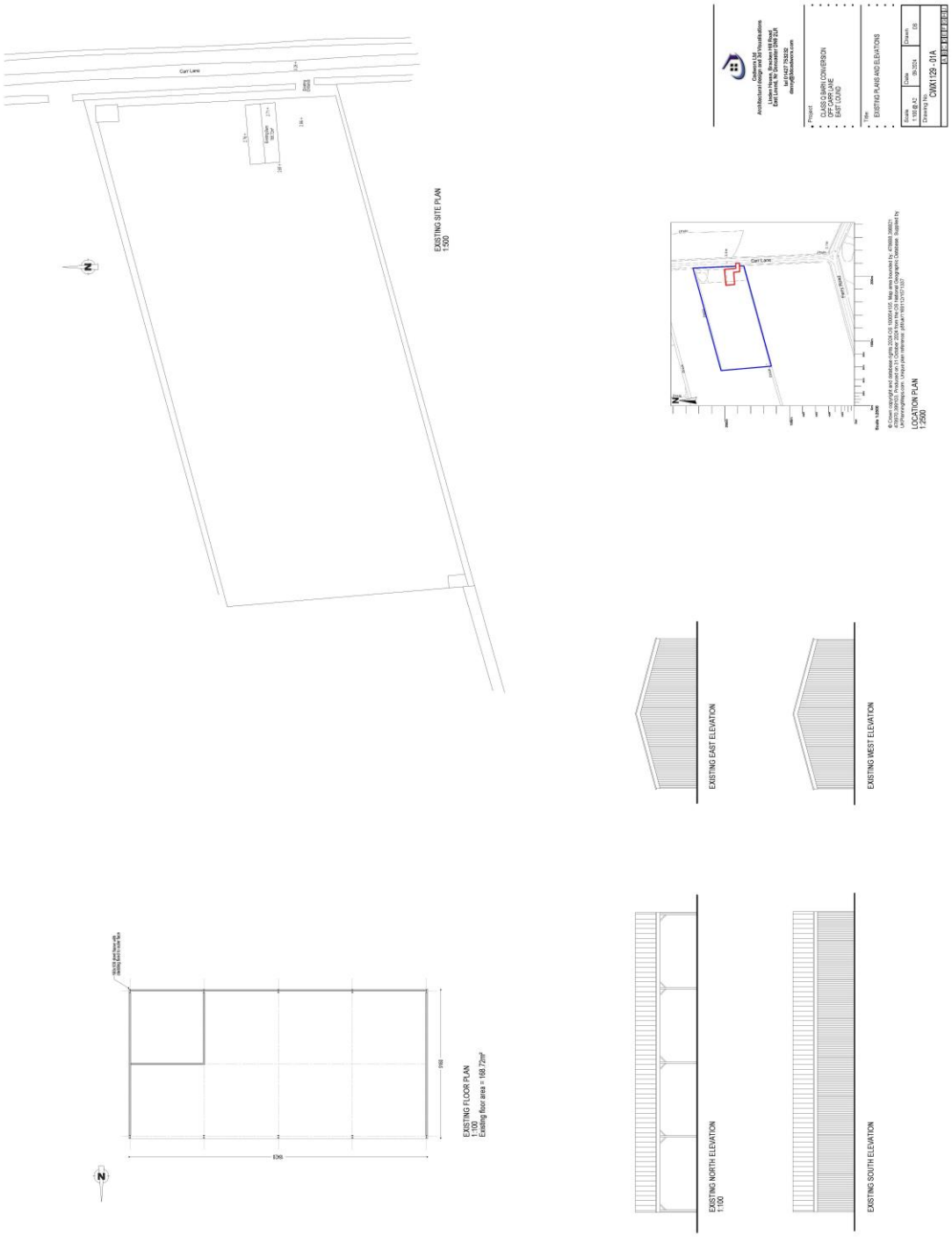
Based on current EA river modelling it is considered that dry access and egress will be available at all times from the development on Carr Lane to the north towards East Lound.

A habitable area has been provided within the dwelling at a level of 4.1mOD which will act as a safe area during extreme floods.

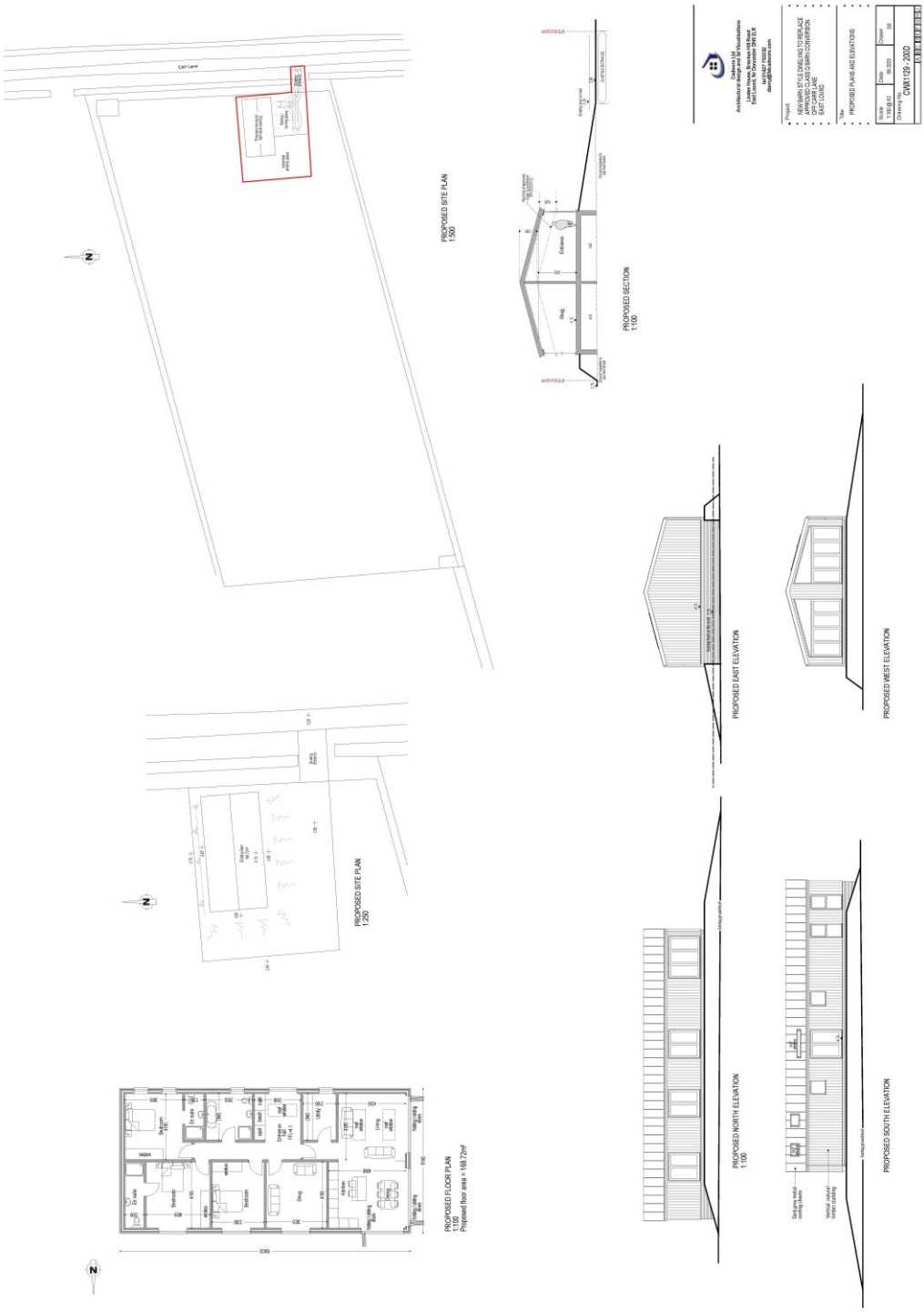
6. CONCLUSION

It is concluded that there is a low risk of flooding from tidal and fluvial sources during defended scenarios. It is considered that the proposed development will provide ground floor levels above the design flood levels for the area.

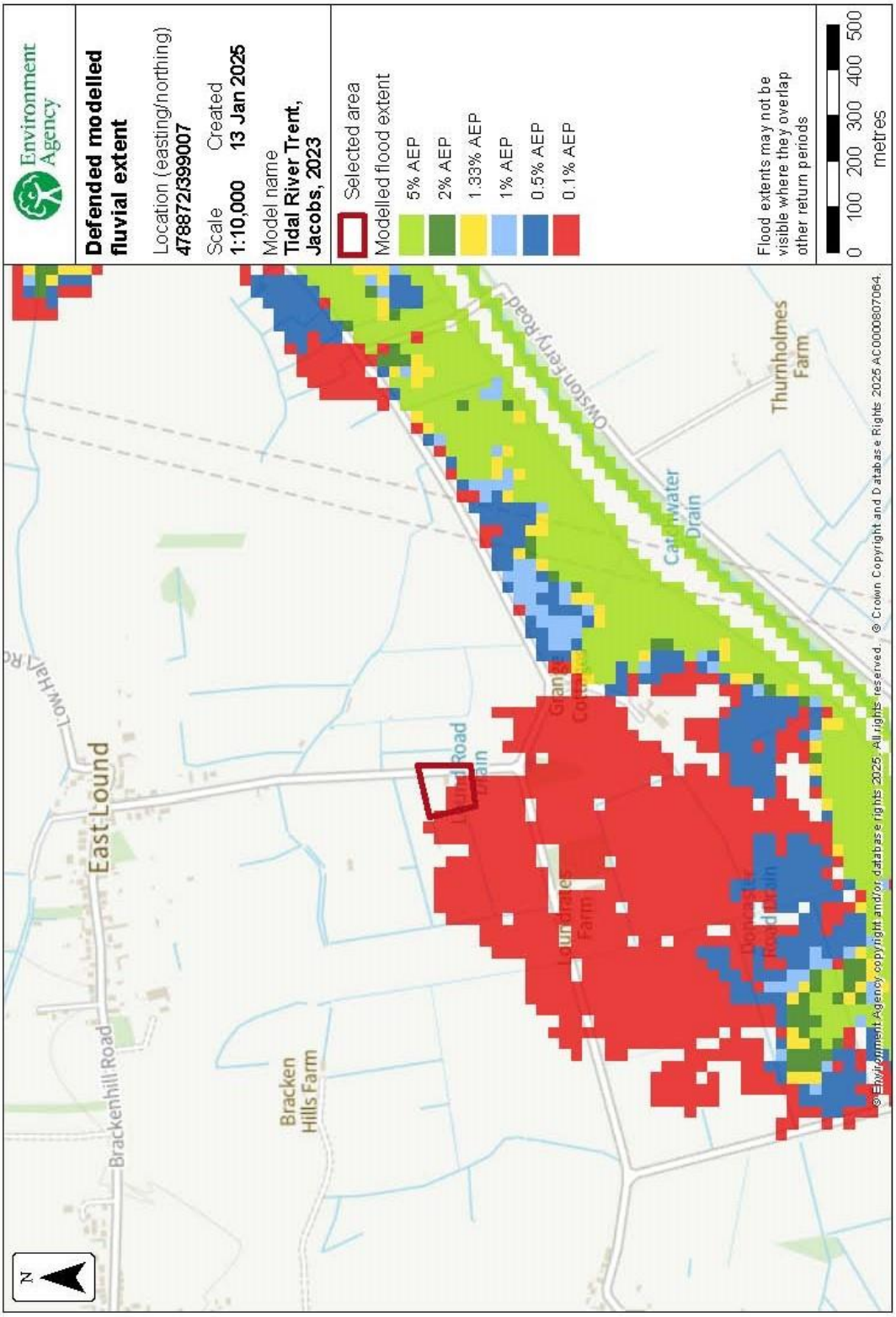
Appendix A: - Existing Site Levels

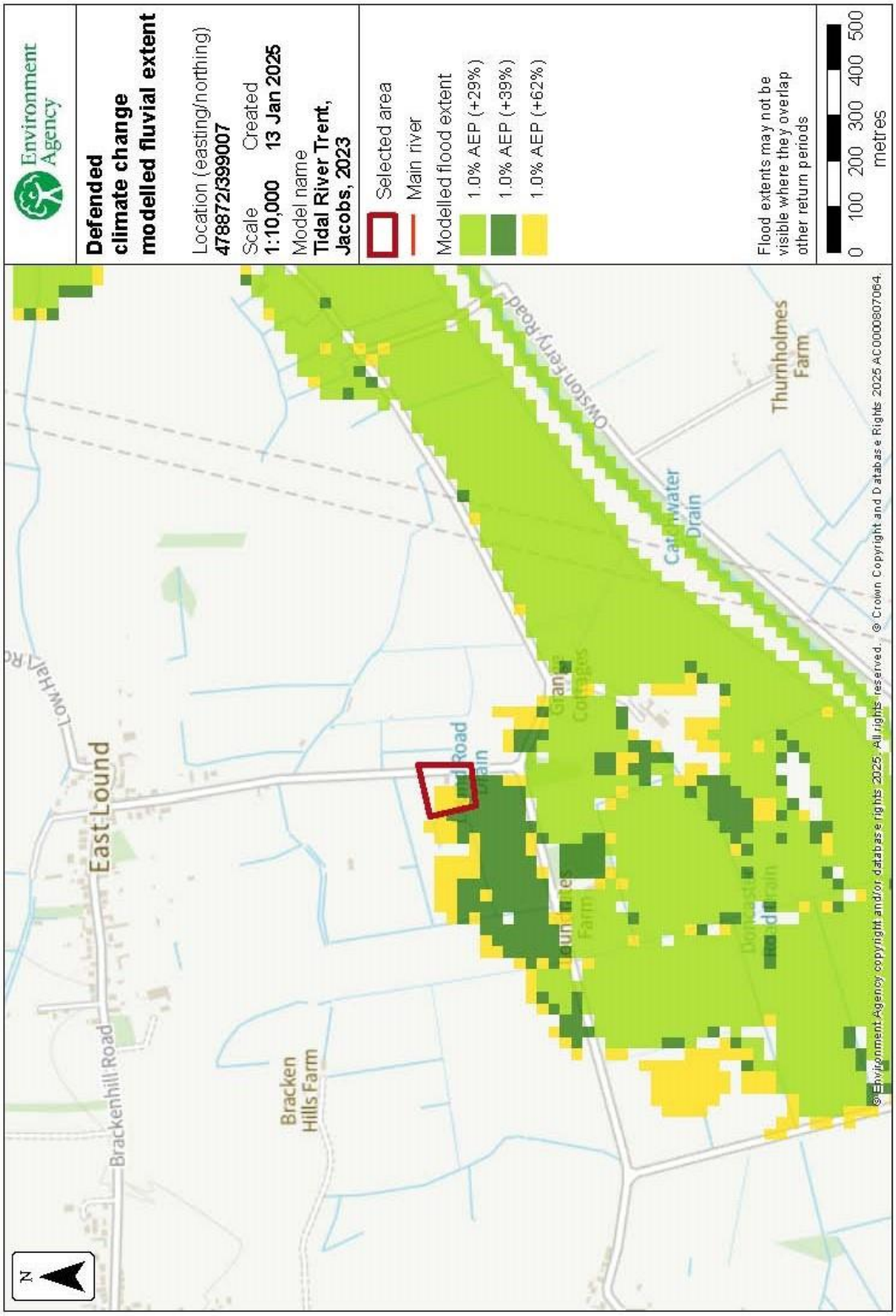


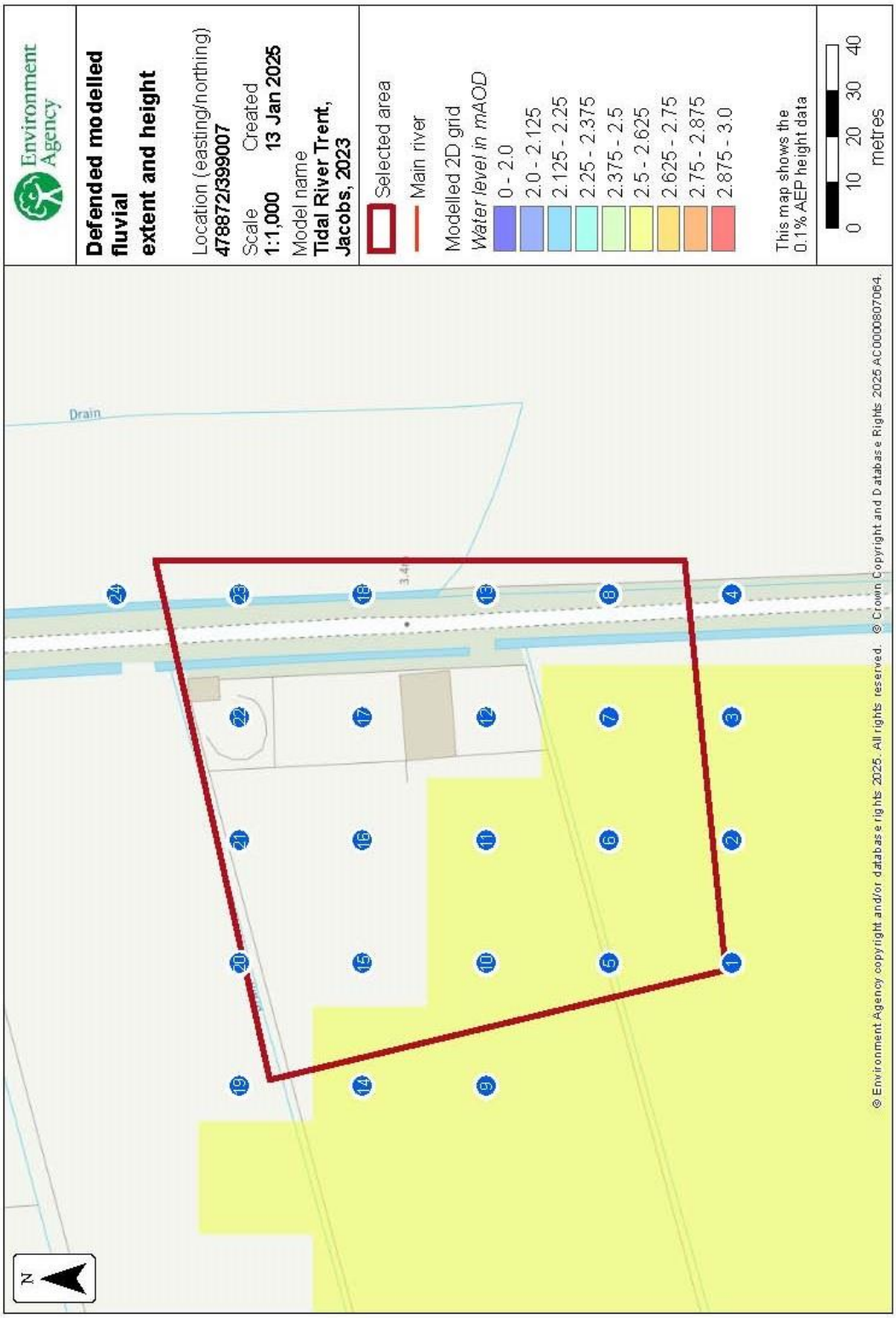
Appendix B: - Proposed Layout Plan



Appendix C: - Environment Agency River Trent Flood Data




Environment Agency
Defended climate change modelled fluvial extent
Location (easting/northing) 478872/399007
Scale 1:10,000
Created 13 Jan 2025
Model name Tidal River Trent, Jacobs, 2023
Selected area
Main river
Modelled flood extent
1.0% AEP (+29%)
1.0% AEP (+39%)
1.0% AEP (+62%)
Flood extents may not be visible where they overlap other return periods
0 100 200 300 400 500
metres
N
East Lound
Brackenhill Road
Bracken Hills Farm
Thurnholmes Farm
Owston Ferry Road
Catchwater Drain
Low Hall Road
© Environment Agency copyright and/or database rights 2025. All rights reserved. © Crown Copyright and Database Rights 2025 AC0000807064.


Environment Agency
Defended modelled fluvial extent and height
Location (easting/northing)
478872/399007
Scale
1:1,000
Created
13 Jan 2025
Model name
Tidal River Trent, Jacobs, 2023
Selected area
Main river
Modelled 2D grid
Water level in mAOD
0 - 2.0
2.0 - 2.125
2.125 - 2.25
2.25 - 2.375
2.375 - 2.5
2.5 - 2.625
2.625 - 2.75
2.75 - 2.875
2.875 - 3.0
This map shows the 0.1% AEP height data
0 10 20 30 40
metres
Drain
N
© Environment Agency copyright and/or database rights 2025. All rights reserved. © Crown Copyright and Database Rights 2025 AC0000807064.

Page 10

Sample point data

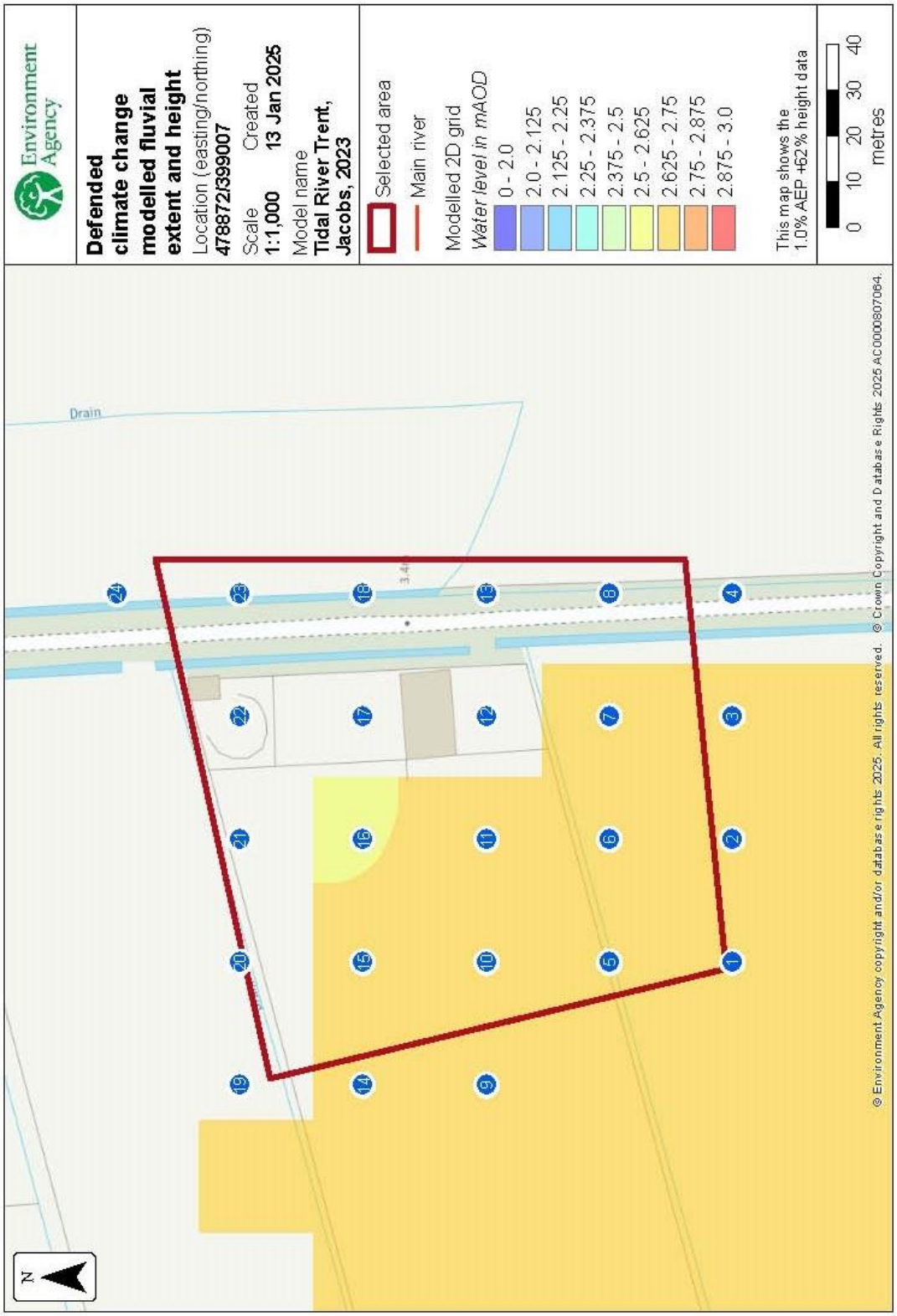
Defended

Label	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
1	478834	398945	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.32
2	478861	398945	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.27
3	478888	398945	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.26
4	478915	398945	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
5	478834	398972	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.19
6	478861	398972	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.29
7	478888	398972	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.56
8	478915	398972	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
9	478807	398999	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.17
10	478834	398999	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.11
11	478861	398999	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.08
12	478888	398999	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
13	478915	398999	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
14	478807	399026	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.13
15	478834	399026	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
16	478861	399026	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
17	478888	399026	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
18	478915	399026	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
19	478807	399053	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
20	478834	399053	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
21	478861	399053	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
22	478888	399053	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
23	478915	399053	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
24	478915	399080	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			Could not determine	Could not determine	Could not determine	Could not determine	Could not determine	Could not determine	Could not determine	Could not determine	Could not determine	0.56

Data in this table comes from the Tidal River Trent, Jacobs, 2023 model.
Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.
If no height or depth data is available for a scenario, no table will be shown.
'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.

Page 12


Environment Agency
Defended climate change modelled fluvial extent and height
Location (easting/northing) 478872/399007
Scale 1:1,000
Created 13 Jan 2025
Model name Tidal River Trent, Jacobs, 2023
Selected area
Main river
Modelled 2D grid Water level in mAOD
0 - 2.0
2.0 - 2.125
2.125 - 2.25
2.25 - 2.375
2.375 - 2.5
2.5 - 2.625
2.625 - 2.75
2.75 - 2.875
2.875 - 3.0
This map shows the 1.0% AEP +62% height data
0 10 20 30 40
metres
Drain
N
© Environment Agency copyright and/or database rights 2025. All rights reserved. © Crown Copyright and Database Rights 2025 AC0000807064.

Sample point data

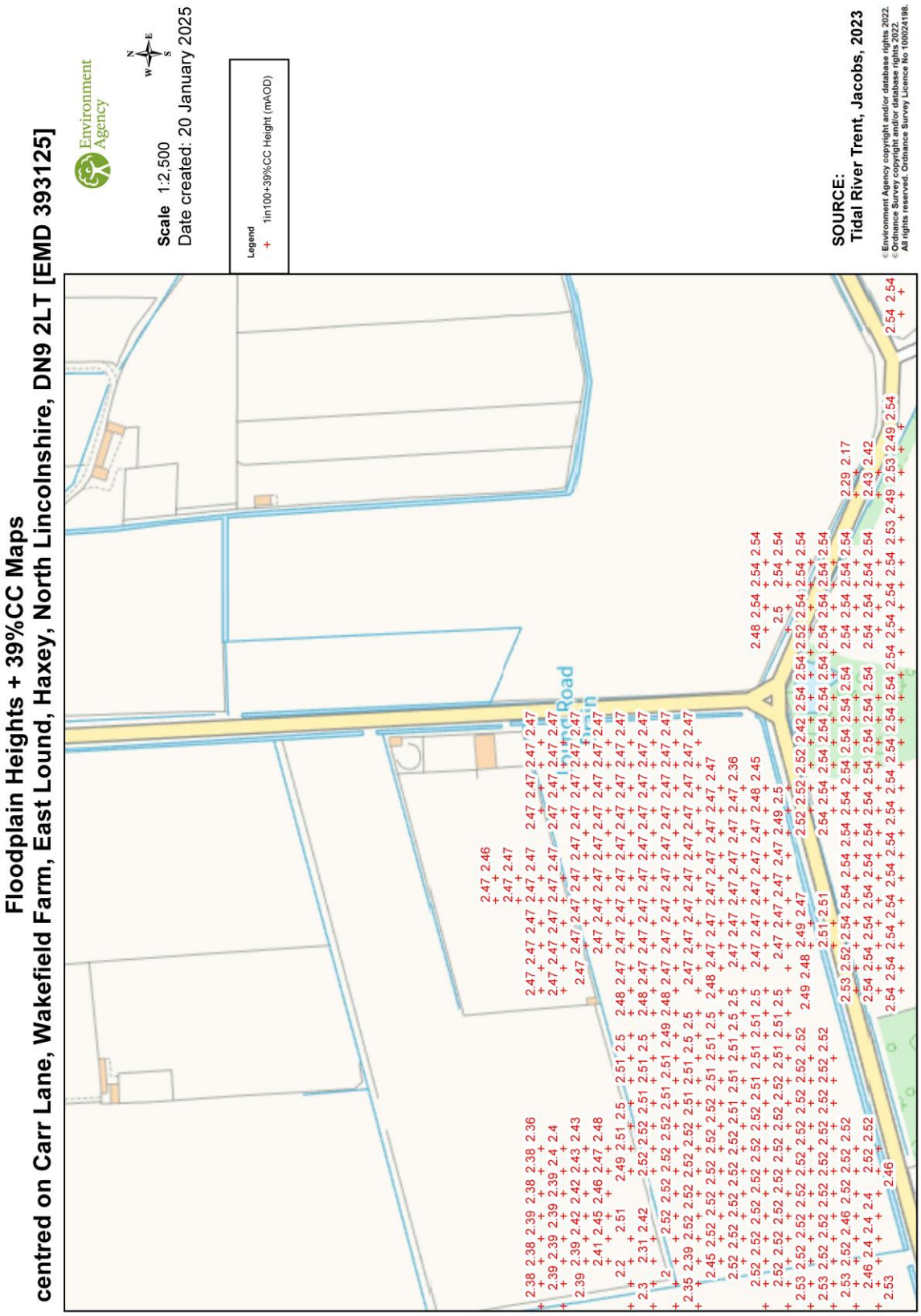
Defended climate change

Label	Easting	Northing	1% AEP (+29%)	1% AEP (+39%)	1% AEP (+62%)	1% AEP (+29%)	1% AEP (+39%)	1% AEP (+62%)
			Depth	Depth	Depth	Height	Height	Height
1	478834	398945	NoData	0.17	0.34	NoData	2.47	2.63
2	478861	398945	NoData	0.12	0.28	NoData	2.47	2.63
3	478888	398945	NoData	0.11	0.28	NoData	2.47	2.63
4	478915	398945	NoData	NoData	NoData	NoData	NoData	NoData
5	478834	398972	NoData	NoData	0.20	NoData	NoData	2.63
6	478861	398972	NoData	0.14	0.31	NoData	2.47	2.63
7	478888	398972	NoData	0.41	0.58	NoData	2.47	2.63
8	478915	398972	NoData	NoData	NoData	NoData	NoData	NoData
9	478807	398999	NoData	0.02	0.19	NoData	2.47	2.63
10	478834	398999	NoData	NoData	0.12	NoData	NoData	2.63
11	478861	398999	NoData	NoData	0.09	NoData	NoData	2.63
12	478888	398999	NoData	NoData	NoData	NoData	NoData	NoData
13	478915	398999	NoData	NoData	NoData	NoData	NoData	NoData
14	478807	399026	NoData	NoData	0.14	NoData	NoData	2.63
15	478834	399026	NoData	NoData	0.07	NoData	NoData	2.63
16	478861	399026	NoData	NoData	0.00	NoData	NoData	2.62

Label	Easting	Northing	1% AEP (+29%)	1% AEP (+39%)	1% AEP (+62%)	1% AEP (+29%)	1% AEP (+39%)	1% AEP (+62%)
			Depth	Depth	Depth	Height	Height	Height
17	478888	399026	NoData	NoData	NoData	NoData	NoData	NoData
18	478915	399026	NoData	NoData	NoData	NoData	NoData	NoData
19	478807	399053	NoData	NoData	NoData	NoData	NoData	NoData
20	478834	399053	NoData	NoData	NoData	NoData	NoData	NoData
21	478861	399053	NoData	NoData	NoData	NoData	NoData	NoData
22	478888	399053	NoData	NoData	NoData	NoData	NoData	NoData
23	478915	399053	NoData	NoData	NoData	NoData	NoData	NoData
24	478915	399080	NoData	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			Could not determine	0.41	0.58	Could not determine	2.47	2.63

Data in this table comes from the Tidal River Trent, Jacobs, 2023 model.
Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.
If no height or depth data is available for a scenario, no table will be shown.
'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.

Page 20


Floodplain Heights + 39%CC Maps
centred on Carr Lane, Wakefield Farm, East Lound, Haxey, North Lincolnshire, DN9 2LT [EMD 393125]
Environment Agency
Scale 1:2,500
Date created: 20 January 2025
Legend
1in100+39%CC Height (mAOD)
SOURCE:
Tidal River Trent, Jacobs, 2023
© Environment Agency copyright and/or database rights 2022.
© Ordnance Survey copyright and/or database rights 2022.
All rights reserved. Ordnance Survey Licence No 100024198.
Isle Road
Drain