



Flood Risk Assessment

**Riverside Business Park
Todmorden Road
Littleborough
Rochdale
OL15 9EG**

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Revision	Date	Reason
0	December 2021	Original to support planning application.
1	October 2022	Updated for full site & associated proposals on Units 2 & 5.
2	Sept 2023	Updated for 2No. new units, latest flood risk data.

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1 FRA Zone 3 Introduction.

Purpose of Flood Risk Assessment:

Riverside Business Park comprises 5No. modern built commercial units with a dilapidated building and former car wash structure.

The purpose of the flood risk assessment is to inform & accompany a planning application for the construction of 2No. new commercial units, replacing the dilapidated unit and car wash.

Reference:

National Planning Policy Framework and the Planning Practice Guidance (flood risk & coastal change notes).

EA mapping data identifies the Application Site as being in flood zone 3, refer to EA flood zone map in the Appendix. Flood zone 2 is defined as land assessed as having between a 1:100 & 1:1000 or greater annual probability of river flooding (0.1-1%) in any year (land shown in light blue on the EA Flood Map). Flood zone 3 is defined as land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) in any year (land shown in dark blue on the EA Flood Map). Flood zone 1 is any area outside of flood zones 2 & 3.

The Planning Practice Guidance indicates the flood risk vulnerability classification (Table 2) for the Application Site end use to be 'less vulnerable'. The flood risk 'vulnerability' and flood zone 'compatibility' matrix (Table 3) indicates that 'less vulnerable' development is acceptable in flood zone 3 areas subject to the Exception Test being passed.

Preliminary or Full Flood Risk Assessment:

Full to support planning application.

1.1 Plans.

1.1.1 Location Plan.

See Location Plan in Appendix showing the area features.

The Application Site is on Todmorden Road in Littleborough.

The rear east boundary of the Site is formed by the River Roch, and the south boundary by Town House Brook. The two watercourses share a confluence at the southeast corner of the Site continuing to flow south towards Littleborough Centre.

Town House Brook to the west of the Site is canalised through the local area and is culverted below Todmorden Road.

1.1.2 Site plan.

Refer to Proposed Plans in the appendix.

The Application Site comprises a relatively newly constructed commercial complex, loosely based on the footprint of the former fuelling station.

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The current Site comprises commercial steel framed units with external powder coated metal cladding profile sheet to both the roof and walls.

There are 5No. existing units within the Site, nominally central to the plot and with surrounding car park/yard areas.

The existing dilapidated unit is located between units 2, 3, and 5. The car wash is nominally to the centre south boundary. Both structures will be replaced by new units.

1.2 Derivation of Data, Surveys and Models.

1.2.1 Existing and proposed topography.

A survey of the Site was undertaken on the 15.12.2021, refer to plan in Appendix.

The survey was taken from an OSBM on the northeast corner of No.93 Todmorden Road: 145.38.

Pertinent levels are as follows (all in m aOD):

UNIT 1	145.55	FFL & threshold level.
UNIT 2	145.79	FFL & threshold level.
UNIT 3	145.42	External threshold level only.
UNIT 4	145.78	FFL & threshold level.
UNIT 5	145.78	FFL & threshold level.
Delapidated building	145.50	nominal GL
Car wash	145.50	nominal GL

There was a concrete bund wall adjacent the Site and watercourses which had a level of 145.78-145.81 to the west side adjacent the River Roch; and was between 145.53 to 145.56 to the southwest boundary adjacent Town House Brook. The concrete bund wall top was essentially at ground level around the perimeter of the Site and can be considered as the point above which flood water would be out of bank for both the River Roch and Town House Brook to the east side of Todmorden Road.

The minimum level of banking and walls to Town House Brook west of Todmorden Road was 146.17 above which water would be out of bank.

1.3 Assessments.

1.3.1 Existing Site surface water system.

The Application Site comprises the commercial premises of various uses.

There are numerous existing gullies and surface water which are assumed to ultimately discharge to the watercourses.

1.3.2 Proposed Site surface water system.

No additional hardstandings will be created as part of the development proposals, and thus no extra runoff will be produced.

1.3.3 Climate change impacts.

As identified in the Background Section, development vulnerability is classified as 'less vulnerable'.

The planning flood maps designate the Site as being within flood zone 3. EA guidance specifies climate change allowances by management catchment areas; specific to the catchment the Site is within. Peak flow river maps have been produced which specify the climate change allowances to be used:



	Central	Higher	Upper
2020s	12%	15%	24%
2050s	19%	26%	43%
2080s	35%	46%	75%

The EA guidance indicates the peak flow rates that should be used for the vulnerability classification:

- essential infrastructure – use the higher central allowance
- highly vulnerable – use central allowance (development should not be permitted in flood zone 3a)
- more vulnerable – use the central allowance
- less vulnerable – use the central allowance
- water compatible – use the central allowance

Given the 'less vulnerable' risk category, the Central allowance should be assessed. With the development proposal for a commercial end use, the 2050s timeline is appropriate, which indicates the 19% climate change allowance should be used on peak river flows as a minimum.

1.3.4 Fluvial morphological impacts.

The proposed development will not impact fluvial morphology.

1.3.5 Potential sources of flooding.

Flood risk maps and flow/level data were obtained from the Environment Agency, (refer to appendix).

a. Fluvial flooding from main rivers.

Flooding in Littleborough Centre is caused by the capacity of the Roch bridge/culverts in the centre beneath Halifax Road to become overwhelmed.

Under extreme flow/return period events, the Roch overflows its banks and causing flooding primarily from Littleborough Centre and back up Todmorden Road. The flood flows are held back by elevated levels around the Bridge/culvert.

The River Roch flood levels both around the Application Site are given below, taken from the Environment Agency Littleborough & Rochdale 2013 Flood Model:

Roch SITE flow vs stage (Defended Model 2013 Littleborough)								
AEP %	5	3.33	1.33	1	1(+35%)	1(+75%)	0.5	0.1
Tr (yr)	20	30	75	100	100(+35%)	100(+75%)	200	1000
Node 1 modelled water level	148.33	148.34	148.35	148.35	148.37	148.41	148.36	148.38
Node 1 modelled flow	1.91	1.94	1.99	2.01	2.10	2.25	2.03	2.14
Node 2 modelled water level	145.51	145.55	145.74	145.79	146.08	146.29	145.89	146.17
Node 2 modelled flow	2.05	2.09	2.18	2.20	2.41	4.17	2.26	2.76
Node 3 modelled water level	147.64	147.67	147.74	147.75	147.84	147.86	147.78	147.84
Node 3 modelled flow	12.94	13.72	15.32	15.75	20.09	20.45	16.86	19.70
Node 4 modelled water level	145.83	145.90	146.02	146.03	146.16	146.29	146.05	146.21
Node 4 modelled flow	14.82	16.50	19.28	19.52	20.84	22.03	19.94	21.41
SITE modelled water level	145.41	145.48	145.63	145.65	145.84	146.05	145.69	145.90
SITE modelled flow	16.24	17.62	21.05	21.41	23.18	24.46	21.82	23.71
Node 5 modelled water level	144.73	144.79	145.00	145.03	145.31	145.65	145.11	145.40
Node 5 modelled flow	17.12	18.31	22.14	22.57	24.62	25.96	22.98	25.12
Node 6 modelled water level					145.92	146.06		
Node 7 modelled water level					145.89	146.02		
Node 8 modelled water level					145.84	145.95		

The Product 4 flood risk data indicates the whole area is under flood defence and so the defended data was used as the basis for assessment.

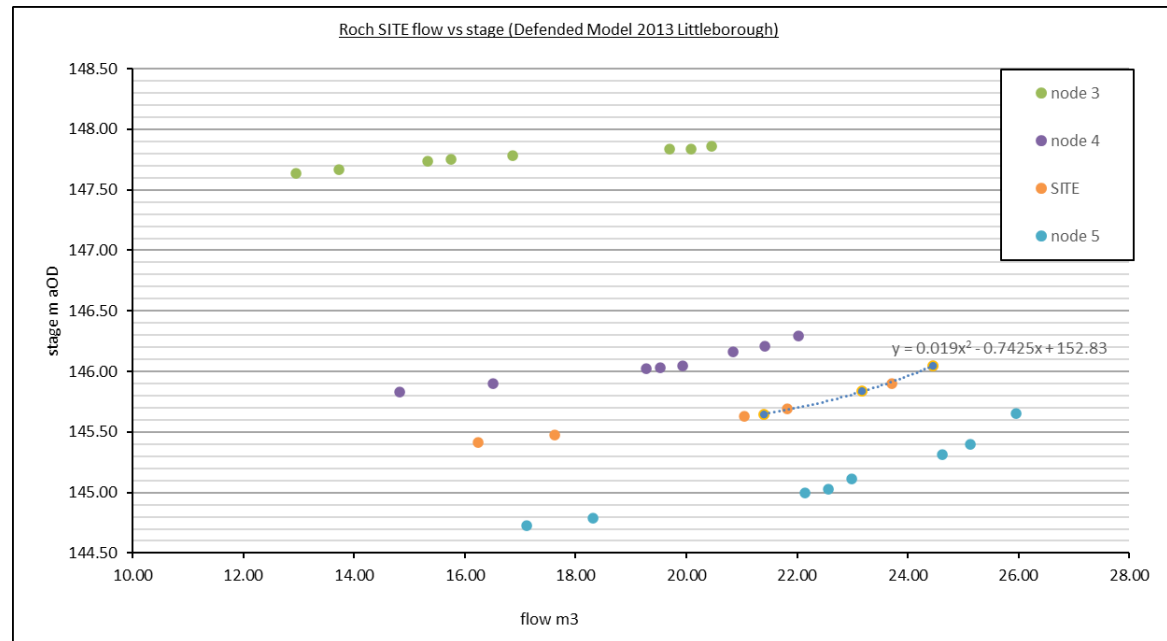
The Site has a calculated climate change allowance of 19% identified from the peak river flow database (see [sect 1.3.3](#)). However, the stage/level values and associated 100yr climate change allowances provided for the Site by the EA were for 35% & 75% climate change predictions, both overestimating potential future level change for the development type.

To estimate the flow & level data for the Site for a 100yr+19% climate change event, the distance the Site, node 4 upstream & node 5 downstream; were calculated to provide approximate pro rata gradient level & flow estimates. The results, highlighted yellow in the

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above table, fit well with the 100yr 35% & 75% level data provided by the EA for the Site (node 8 approximately in the location of the proposed buildings.

This data was plotted on a graph and used to find an appropriate levels for the 100yr+19% climate change as tabulated below:



Flood event	100yr	100yr+35%	100yr+75%	100yr+19% pro rata
Climate change %	0	35	75	19
SITE modelled water level	145.65	145.84	146.05	145.75
w.lvl diff between events	0.00	0.19	0.40	0.10
SITE modelled flow	21.41	23.18	24.46	22.18
flow diff between events	0.00	1.77	3.05	0.77

The design flood level for the 100yr+19% fluvial event to be used in the assessment is therefore 145.75m aOD.

b. Surface Water Risk.

The main risk of flooding in the local area is from fluvial flooding.

c. Fluvial flooding from minor watercourses / drainage channels.

Included in the above fluvial flood risk model data.

d. Artificial Watercourse/Canals.

The Rochdale Canal is approx. 130m east but is not known to be a particular risk at this location.

e. Loss of overland flow.

Overland flow routes will not be affected as part of the development.

f. Loss of Floodplain.

Loss of floodplain will not decrease as part of the development.

g. Springs and high groundwater levels.

It is likely that ground water levels are controlled primarily by river levels in the local area and therefore present no more of a risk.

h. Surcharging of local drainage & sewerage systems.

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It is likely that in extreme flooding events that the local sewers will flood. However, the risk is more prominent with properties that have cellars which this development does not have.

i. Reservoirs.

There is a risk of reservoir flooding in this area, however, the Environment Agency indicates the risk from of flooding is highly unlikely. In addition, flooding from reservoirs is thought to be a much lower risk than that from other sources described above.

1.4 Design.

The Application is for a construction of replacement buildings and will comprise similar construction to those already on Site such as: steel framed structures with powder coat cladding to the external leaf, with internal blockwork partitions, dado walls & concrete floor slabs.

Finished Floor Levels should be a minimum of 145.95m aOD. This is 300mm above the proposed 1:100yr flood level event, and also protects against the 100yr+19% climate change event.

All electrics and services, resilient design etc should be taken above the 100yr+75% climate change flood level of 146.05m aOD.

1.4.1 Resilient Design.

Resilient design should be utilised in proposed development.

1.4.2 Construction.

- solid flooring such as tiling, stone slabs, concrete screed etc;
- solid masonry partition walls (if required), OR steel studding & cement board;
- sand/cement render in place of plaster if required;
- flood resilient upvc or hardwood doors.

1.4.3 Internal fixings & finishes.

- all internal finishes and fixings up to the flood level should comprise resilient materials such as hardwood/upvc/vinyl/plastics to skirts & frames, with water resistant paints to walls etc.

1.4.3.1 Services.

- All mains service meters such as the water meters, electrical fuse box, gas meter & boilers & associated plug points etc; should be installed (or repositioned) above the identified flood level which is 146.05m aOD.

2 Emergency Evacuation Plan

2.1 Section 1-4. Scope, Location, Risk & Mitigation

The Adept/Environment Agency guidelines indicate the requirements for flood risk emergency plans (EP) for new development. An EP would generally contain the following sub-sections:

- Section 1. Scope, Objectives and Background.
- Section 2. Location and Proposal.
- Section 3. Risk Summary.
- Section 4. Mitigation Measures.
- Section 5. Flood Warnings and Associated Actions.
- Section 6. Safe Access and Escape.
- Section 7. Temporary Refuge.
- Section 8. After the Flood.
- Section 9. List of Roles.

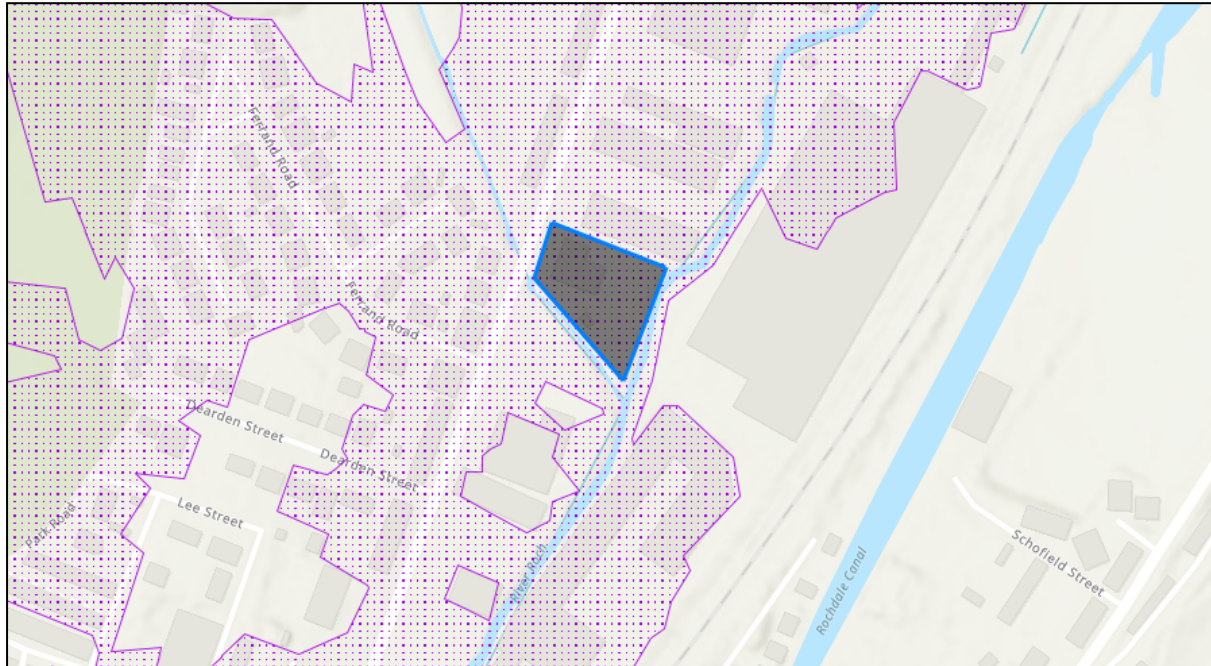
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- Section 10. Plan Upkeep and Awareness.

The previous sections of this report have covered the information required for sub-sections 1-4 noted above required for an EP, and thus this EP section shall start at subsection 5 – Flood Warnings & Associated Actions.

2.2 Section 5. Flood Warnings and Associated Actions

The Site is within a flood risk warning area, refer to flood alert map below:



FLOOD INFORMATION SERVICE

Dwellings or businesses in England can sign up for the Environment Agency free flood alert service by phone, email or text message, if either homes or businesses are at risk of flooding.

The Site is within the Environment Agency Flood Warning Area and it is strongly advised that the Owner/Tenant, must sign up to receive flood warnings via the Environment Agency Flood Information Service.

The current & simple to follow flood alert/warnings used by the Environment Agency, including a simple/easy to understand statement of what is required for each as follows:

Flood alert - Prepare

- prepare a bag that includes medicines and insurance documents
- check flood warnings

Flood warning - Act

- turn off gas, water and electricity
- move things upstairs or to safety
- move family, pets and car to safety

Severe flood warning - Survive

- call 999 if in immediate danger
- follow advice from emergency services
- keep yourself and your family safe

The Flood Information Service can be found on the internet using the following URL: <https://flood-warning-information.service.gov.uk/warnings>.

FLOODLINE

Alternatively, people at risk from flooding and without access to the internet can register for flood alert warnings & get in touch by calling Floodline on telephone: 0345 988 1188 OR Type talk: 0345 602 6340 (for the hard of hearing), which is a 24hr service.

For flood alerts/warnings, people will need to provide the following information:

- the address to be registered.
- a phone number for the person or people requesting the service can be contacted on 24hrs a day.
- an email address for the person or people requesting the service.

FLOOD WARDENS

Flood Wardens operate in some areas to provide alerts to the local community when flood warnings are issued. Contact Floodline on 0845 988 1188 to find out if this service is available in the area.

SIRENS/LOUDHAILERS

Sirens/loudhailers operate in some areas at risk from extreme flooding to alert residents that a flood warning is in force. Contact Floodline on 0845 988 1188 to find out if this service is available in the area.

GENERAL MEDIA

Media such as the Flood Information Service website details maps and current (up-to-date) area specific advice for all areas of England, including the type of flooding and flood alert/warning level in force for those areas. Other websites such as the Met Office have their own flood alert service. TV & radio news channels give warnings.

2.3 Section 6. Safe Access and Escape

In flood risk areas, safe access and exit from new developments should be in accordance with the Adept EP guidance, and that of the referenced background documentation Defra/EA R&D Technical Report FD2320/TR2; and should be in the following order of preference:

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- Safe dry route for people and vehicles.
- Safe dry route for people.
- If a dry route for people is not possible, a route for people where the flood hazard (in terms of depth and velocity of flooding) is low and should not cause a risk to people.
- If a dry route for vehicles is not possible, a route for vehicles where the flood hazard (in terms of depth and velocity of flooding) is low to permit access for emergency vehicles. However, the public should not drive vehicles in floodwater.

Although the Site and Units 2 & 6 are within Flood Zone 3, due to its location within a flood warning area – there will be plenty of notice for people to evacuate to Flood Zone 1 prior to a flood event taking place. The Site is a place of business and so people will use it between normal working hours and have access via foot or vehicle to Flood Zone 1 which is 300m north along Todmorden Road and accessible to both users; and so egress from the building will be presented from the perspective of a 'safe dry route for people & vehicles'.

The Environment Agency guidance is clear: when a flood alert to PREPARE is issued, preparations should be enacted in case a further flood warning to ACT is given, and business owners should be ready for this scenario.

When a flood warning to ACT is issued, business owners should alert customers & follow instructions to evacuate as per the Emergency Evacuation Route Plan below – assuming a flood event could be imminent.



This route provides the easiest route for pedestrians, users with specific needs such as wheelchair users or those with pushchairs & vehicular users.

HOWEVER - DRIVING OR PEDESTRIAN MOVEMENTS SHOULD NOT BE ATTEMPTED THOROUGH FLOOD WATERS.

2.4 Section 7. Temporary Refuge

The Site is not suitable for temporary refuge in an extreme storm event.

The Site should be evacuated prior to a flood event when instructed to ACT by the Flood Warning Service.



If flood advice is required as an emergency, the Environment Agency has specially trained Flood Support Officers who provide information and advice during and after floods. Call Floodline (24-hour service) on 0345 988 1188 or type-talk (for the hard of hearing) on 0345 602 6340 to find out if they are active in the local area.

2.5 Section 8. After the Flood

Clean-up will be required following an extreme storm event, and the following procedures should be followed:

- Contact your insurance company.
- Cleaning and repairing the property.

Specialist advice will likely be required and may need to be undertaken in accordance with insurance company requirements.

Photographs to document damage and record the flood water height.

Flood water can be hazardous and contain sewage, chemicals, and animal waste. Care should be taken with personal protective equipment.

Contact the LPA about disposing of large flood damaged items.

- Stay healthy – ensure services are running properly and potable water does not have a change in colour, taste or smell. Ensure food touched by flood water is disposed of.
- Get help via Floodline if required.
- Get emotional support if required from family, friends, GP, or charity organisations.
- Apply for financial aid if required. Apply to Rochdale Council for eligibility.

2.6 Section 9. List of Roles

It is the Owner/Tenants responsibility to follow this EP and keep up to date with current advice, and warn staff and customers of flood warning advice.

2.7 Section 10. Plan Upkeep and Awareness

The Owner/Tenant should be given a copy of this Flood Mitigation Report by the Developer or previous owner within the building deed pack.

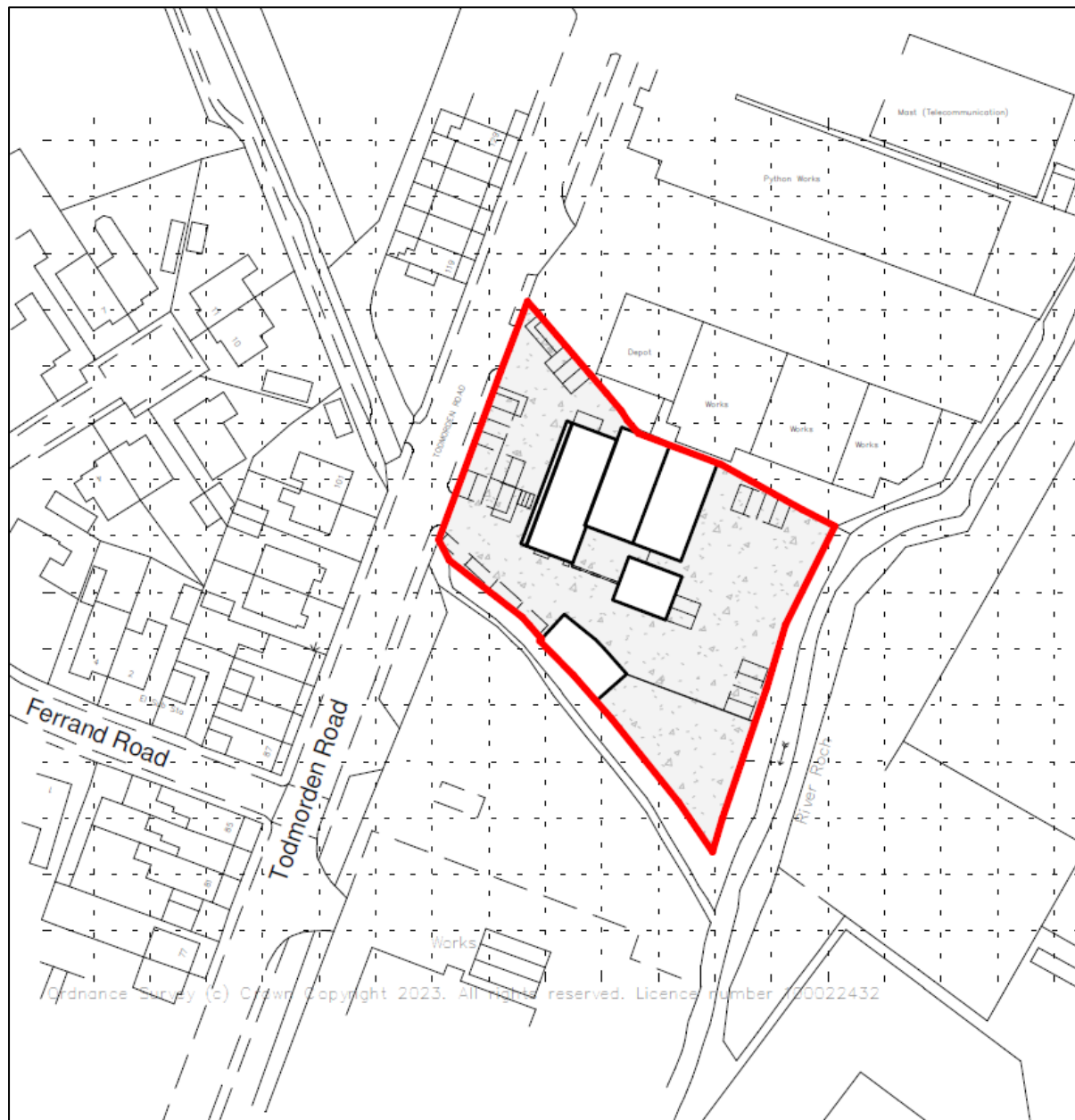
The Owner/Tenant should ensure they are familiar with the Evacuation Plan and procedures and keep up to date with latest Environment Agency Guidance.

3 Conclusion & Residual risks.

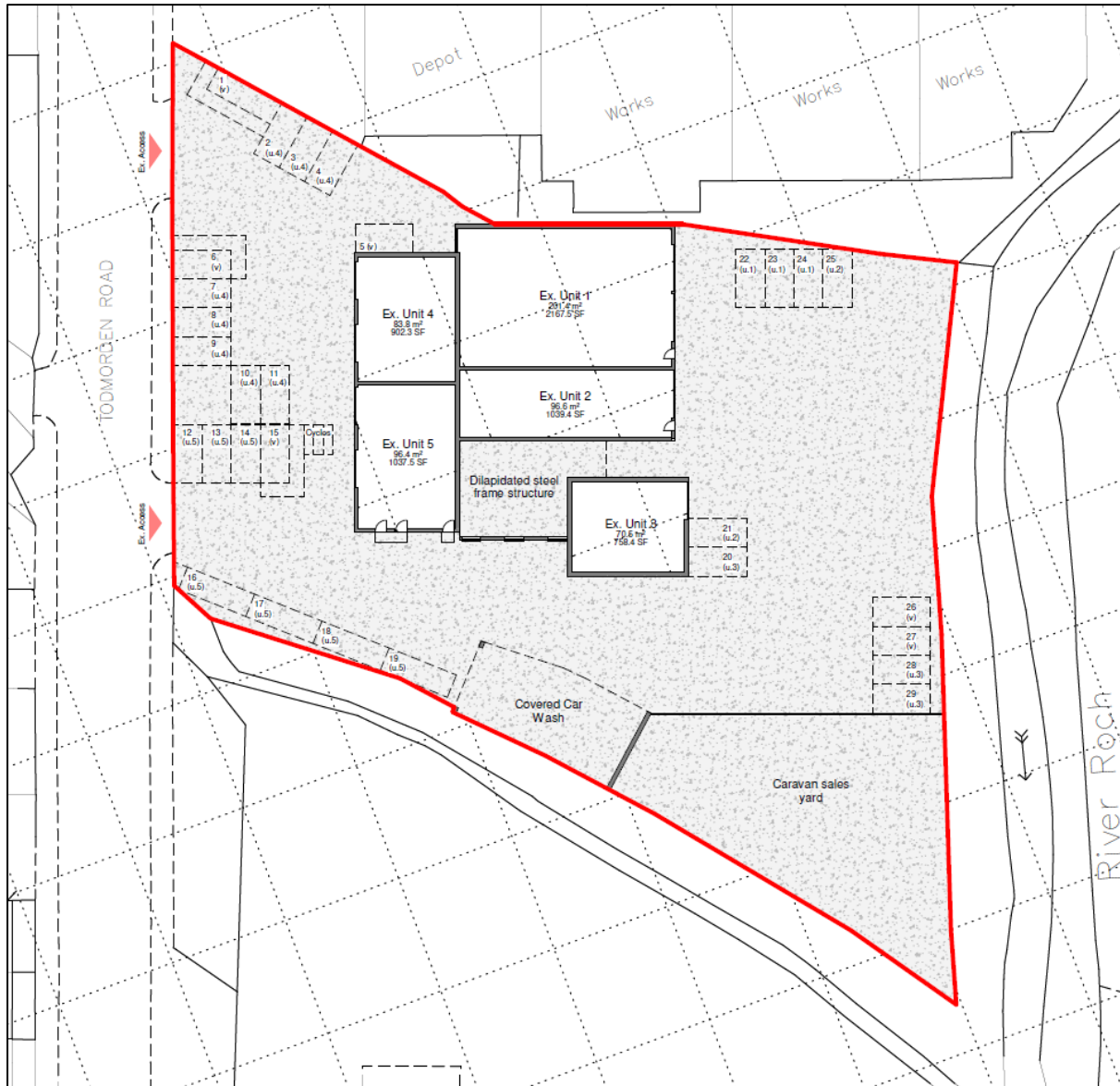
No residual risks.

4 Appendix.

4.1 Location Plan.

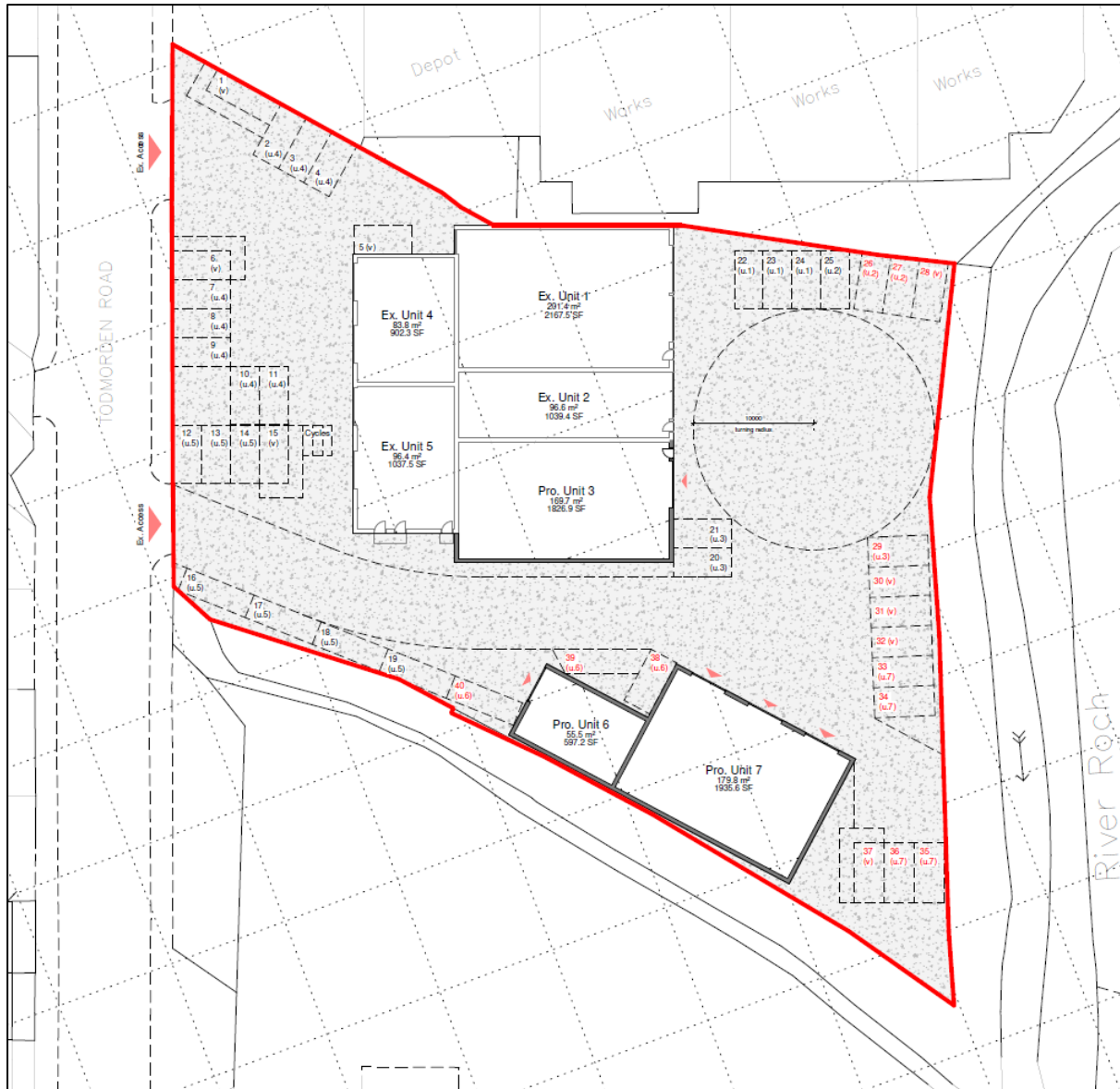


4.2 Existing Plans.



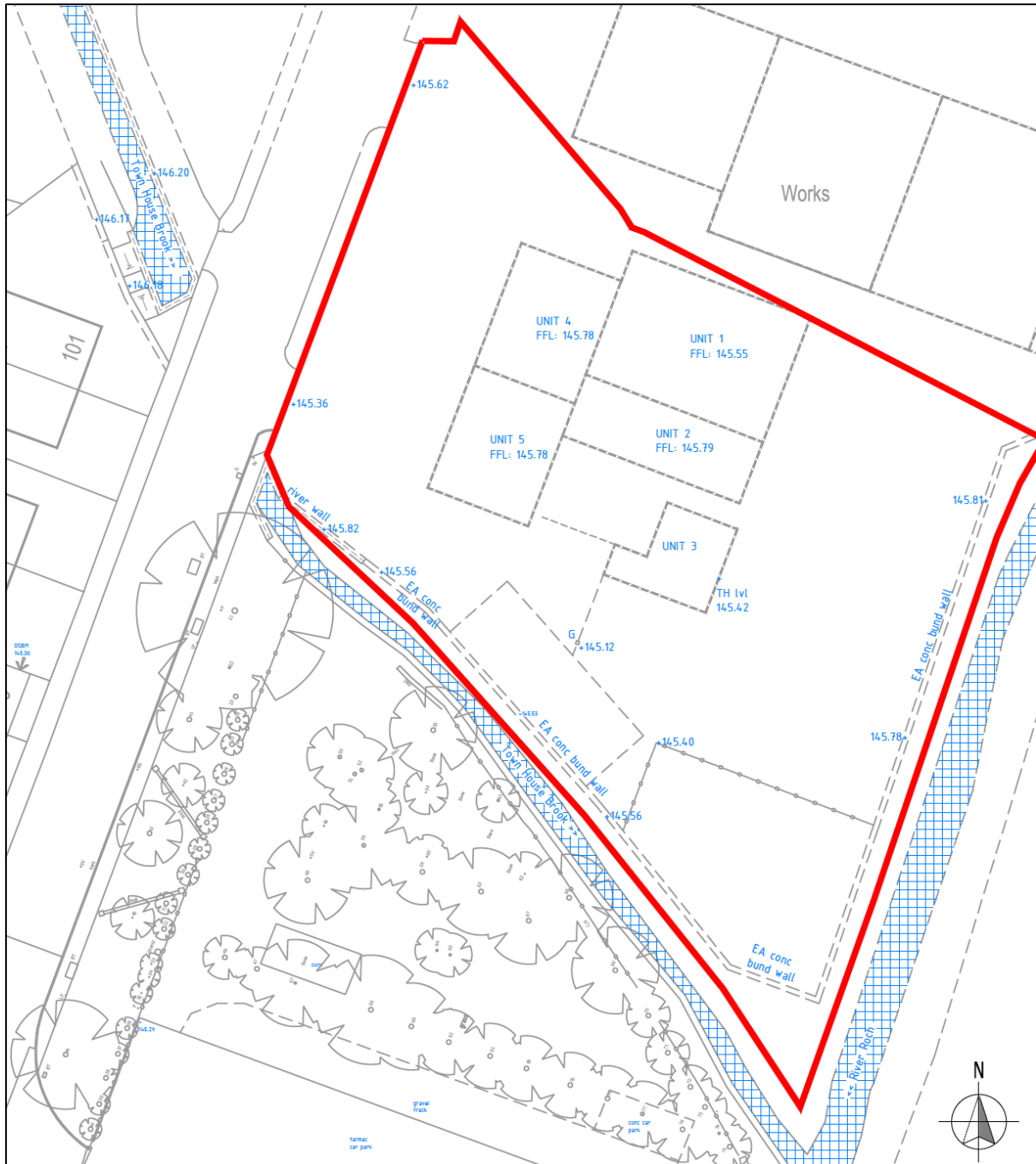
Site Plan not oriented north.

4.3 Proposed Plans.



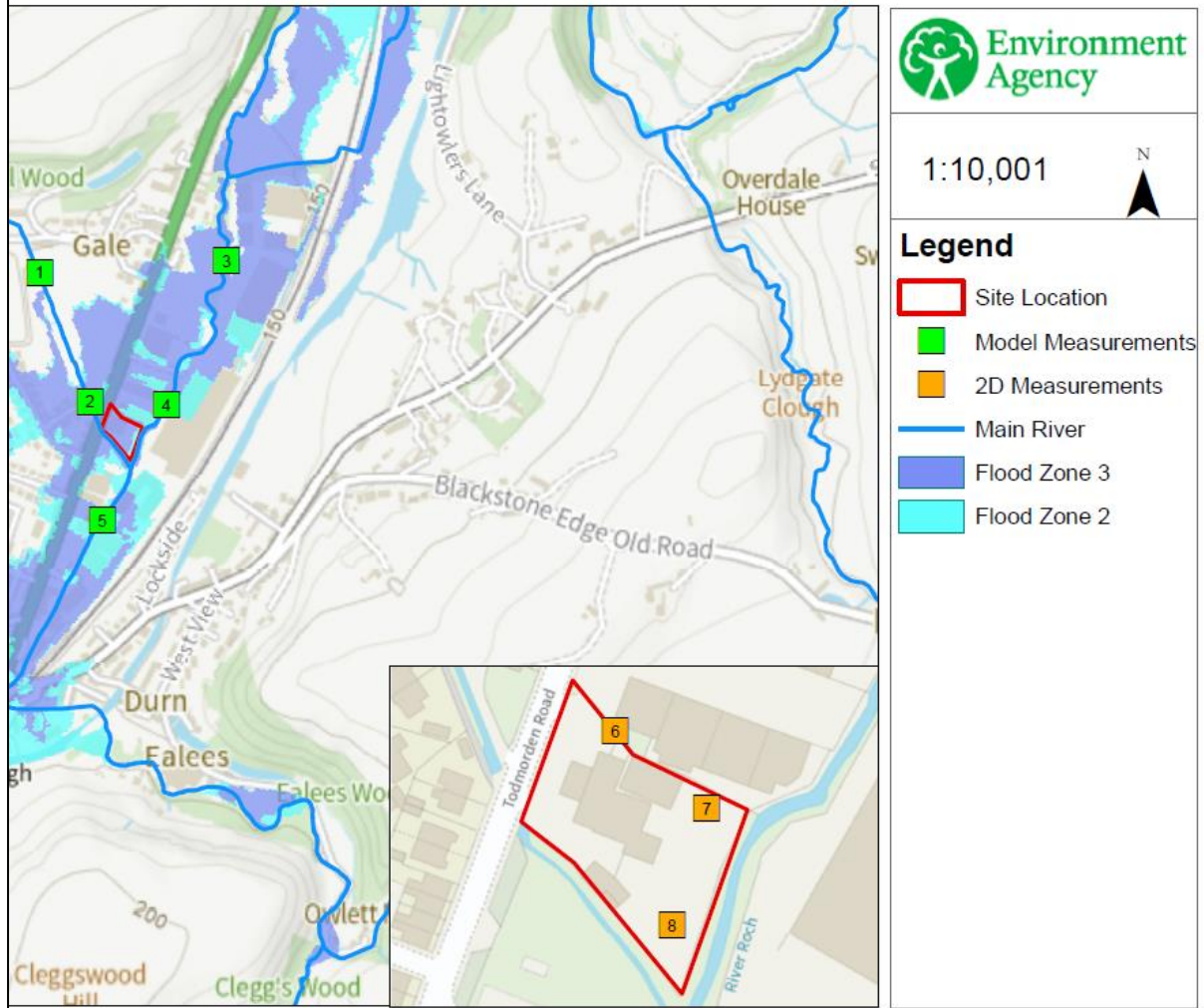
Site Plan not oriented north.

4.4 TJBA Level Survey.



4.5 Environment Agency Product 4 Detailed Flood Map.

**Centred on Todmorden Road, Littleborough, OL15 9EG.
Created 25/09/2023 [GMMC327128JM]**



4.6 Environment Agency Product 4 Flood Data Table.

25/09/23

GMMC327128JM

Map Reference	Model Node Reference	Easting	Northing	Data	Undefended								Defended							
					5 % AEP (1 in 20 year)	3.33 % AEP (1 in 30 year)	1.33 % AEP (1 in 75 year)	1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year) + 35% Increase flow	1 % AEP (1 in 100 year) + 70% Increase flow	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)	5 % AEP (1 in 20 year)	3.33 % AEP (1 in 30 year)	1.33 % AEP (1 in 75 year)	1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year) + 35% Increase flow	1 % AEP (1 in 100 year) + 70% Increase flow	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)
1	ea013_0180_TOWH01_353	393067	417064	Modelled Water Level (m aodN)	148.33	148.33	148.34	148.35	148.36	148.38	148.35	148.37	148.33	148.34	148.35	148.35	148.37	148.41	148.36	148.38
				Modelled Flow (cumecs)	1.90	1.93	1.98	1.99	2.07	2.15	2.01	2.12	1.91	1.94	1.99	2.01	2.10	2.25	2.03	2.14
2	ea013_0180_TOWH01_158a	394049	416943	Modelled Water Level (m aodN)	145.79	145.81	145.86	145.88	146.00	146.19	145.89	145.98	145.51	145.55	145.74	145.79	146.08	146.29	145.89	146.17
				Modelled Flow (cumecs)	3.14	3.40	4.75	5.05	6.83	13.20	5.68	7.77	2.06	2.09	2.18	2.20	2.41	4.17	2.28	2.76
3	ea013_0180_ROCH05_10355	394282	417085	Modelled Water Level (m aodN)	147.50	147.54	147.59	147.59	147.66	147.72	147.60	147.68	147.64	147.67	147.74	147.75	147.84	147.86	147.78	147.84
				Modelled Flow (cumecs)	12.94	13.95	15.10	15.32	17.53	19.32	15.73	18.12	12.94	13.72	15.32	15.75	20.09	20.45	16.86	19.70
4	ea013_0180_ROCH05_10063	394182	416937	Modelled Water Level (m aodN)	145.53	145.58	145.85	145.89	146.08	146.19	145.94	146.11	145.83	145.90	146.02	146.03	146.16	146.29	146.05	146.21
				Modelled Flow (cumecs)	9.23	9.75	13.26	13.95	18.17	20.16	15.20	18.83	14.62	16.50	19.29	19.52	20.84	22.03	19.94	21.41
5	ea013_0180_ROCH05_09837	394073	416942	Modelled Water Level (m aodN)	144.60	144.66	144.86	144.89	145.29	145.51	144.97	145.36	144.73	144.78	145.00	145.03	145.31	145.65	145.11	145.40
				Modelled Flow (cumecs)	14.81	15.64	20.57	21.41	23.67	24.77	23.08	23.88	17.12	18.31	22.14	22.57	24.62	25.96	22.98	25.12
6	2d Measure	394099	416925	Modelled Water Level (m aodN)						145.89	146.01						145.92	146.06		
7	2d Measure	394128	416803	Modelled Water Level (m aodN)						145.85	146.00						145.89	146.02		
8	2d Measure	394117	416766	Modelled Water Level (m aodN)						145.81	145.90						145.84	145.95		

Model data taken from Rochdale & Littleborough 2013

AEP - Annual Exceedence Probability

m aodN - metres above ordnance datum Newlyn

cumecs - cubic metres per second

Notes: *Climate Change Scenario - 35% and 70% increases in flow calculated for the 2080's (2070 - 2115). Please see <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances> for more information regarding the new climate change guidance. The location of the site and the type (vulnerability) of development determine the climate change allowances to consider in any flood risk assessment.

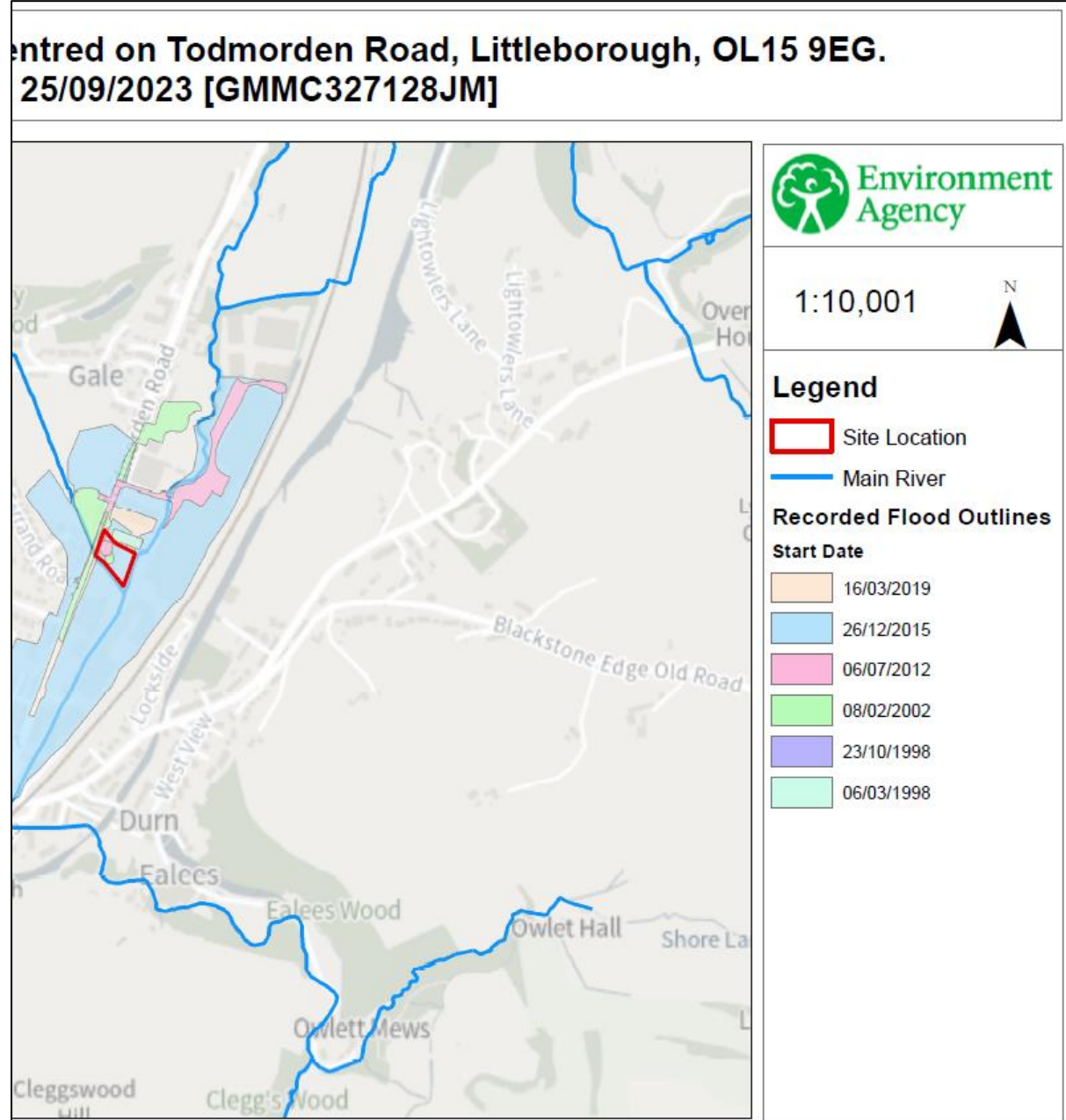
Recorded Flood Outlines					
Flood Event Code	Name	Start Date	End Date	Source of Flooding	Cause of Flooding
18234	ROCH	23/10/1998	24/10/1998	unknown	obstruction/blockage – channel
18489	TOWH	08/02/2002	09/02/2002	main river	channel capacity exceeded (no raised defences)
19044	ROCH	06/03/1998	07/03/1998	unknown	obstruction/blockage – channel
24568	ea01327_06_july_2012_Roch_Greenvale_Business_Park	06/07/2012	06/07/2012	main river	overtopping of defences
4079729	Littleborough	26/12/2015	26/12/2015	main river	overtopping of defences
4086002	Todmorden Road	16/03/2019	16/03/2019	unknown	local drainage/surface water

Flood Defences					
Start Date	Asset Type	Asset ID	Standard of Protection	Upstream Actual Crest Level (m aod)	Downstream Actual Crest Level (m aod)
01/01/2005	Wall	100424	100	146.99	146.27
01/01/2005	Wall	101484	100	145.60	145.81
01/01/2005	Wall	101486	100	146.12	146.13
01/01/2005	Embankment	130621	100	147.47	147.28
01/01/2005	Wall	181966	100	147.30	149.90
01/01/2005	Engineered High Ground	38263	100	145.72	145.73
01/01/2005	Wall	9110	100	145.87	145.90
01/01/2005	Engineered High Ground	9111	100	146.09	146.07
01/01/2005	Wall	9112	100	146.62	145.99
01/01/2005	Natural High Ground	445146	100	149.21	148.03

† Overall condition of the asset based on the (weighted) condition of each element of the latest inspection of the asset. See the attached document 'Visual Condition Grading of FCRM Assets' for interpretation of score given.



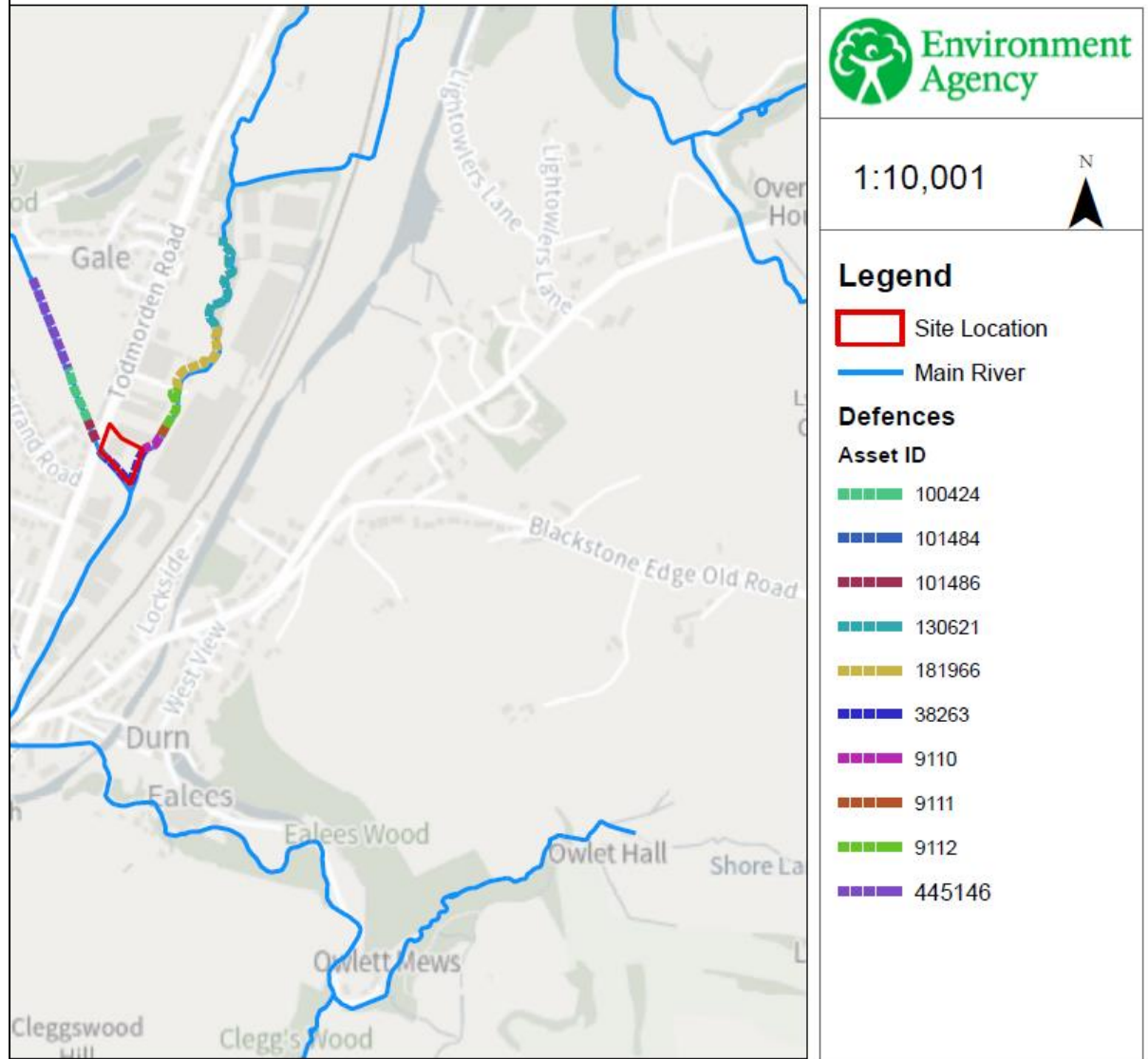
4.7 Environment Agency Product 4 Recorded Flood Outline Map.





4.8 Environment Agency Product 4 Flood Defence Map.

on Todmorden Road, Littleborough, OL15 9EG.
25/09/2023 [GMMC327128JM]



4.9 United Utilities Sewer Plans.

N/A.

**4.10 NPPF Planning Practice Guidance Table 1.****Table 1: Flood Zones**

These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#), available on the Environment Agency's web site, as indicated in the table below.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

4.11 NPPF Planning Practice Guidance Table 2.**More vulnerable**

- Hospitals
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non-residential uses for health services, nurseries and educational establishments.
- Landfill* and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

4.12 NPPF Planning Practice Guidance Table 3.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	✓*

Key:

✓ Development is appropriate

X Development should not be permitted.

Notes to table 3:

- This table does not show the application of the **Sequential Test** which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and **Exception Tests** do not need to be applied to **minor developments** and changes of use, except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

* In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.



4.13 Environment Agency Climate Change Allowances.

Table 1 peak river flow allowances by river basin district (use 1961 to 1990 baseline)

River basin district	Allowance category	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
North West	Upper end	20%	35%	70%
	Higher central	20%	30%	35%
	Central	15%	25%	30%

In flood zone 2

- essential infrastructure – use the higher central and upper end to assess a range of allowances
- highly vulnerable – use the higher central and upper end to assess a range of allowances
- more vulnerable – use the central and higher central to assess a range of allowances
- less vulnerable – use the central allowance
- water compatible – use none of the allowances

In flood zone 3a

- essential infrastructure – use the upper end allowance
- highly vulnerable – development should not be permitted
- more vulnerable – use the higher central and upper end to assess a range of allowances
- less vulnerable – use the central and higher central to assess a range of allowances
- water compatible – use the central allowance

4.14 References.

- Environment Agency Flood Maps.
- Environment Agency Flood & Flow Data.
- Government Planning Practice Guidance.
- EA/DEFRA - Flood Risk Assessment: Standing Advice.