

PIXB – Bradford South

Flood Risk Assessment



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This document uses revision codes in accordance with ISO EN 19650:

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S0: WIP

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S2: Information

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2: Concept

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5: Construction

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1. Introduction & Scope

1.1. Introduction

Booth King Partnership Ltd. (BKP) were commissioned by Whitbread Group PLC to carry out Flood Risk Assessment (FRA) for the conversion of the public house to an annex to the main hotel with 20 additional bedrooms and a smaller restaurant within the Premier Inn Hotel site at Whitehall Rd, Dyehouse Dr, Cleckheaton BD19 6HG.

This FRA has been prepared in accordance with the National Planning Policy Framework (NPPF), Flood Risk and Coastal Change (www.gov.uk/guidance/flood-risk-and-coastal-change) and Planning Practice Guidance, as well as Environment Agency (EA) Guidance and the local Strategic Flood Risk Assessment (SFRA) Level 1. A full list of documents used to inform this report is shown in the Reference section.

Although the site has an area of less than 1 hectare, it lies within predominantly in Flood Zone 2 and a small part of the overall site that includes part of the access road lies within Flood Zone 3 according the EA Flood Map therefore an FRA is compulsory in accordance with the NPPF. The proposed development should not increase the risk of flooding elsewhere and this FRA has therefore been prepared to demonstrate that this has been achieved. Consideration has also been given to BREEAM accreditation, including the requirements of Pol 03, the risk of pollution to controlled waters and the site conditions prior to, during and after development.

This report aims to identify and assess the risks of all forms of flooding to and from the site and demonstrate how these flood risks will be managed, taking climate change into account. The Flood Risk Assessment also considers the management of surface water run-off and outlines the proposed drainage strategy.

It is the assumption wherever possible that ground levels post-development will remain as close to existing as is practical. If this or other key assumptions change, then the conclusions within this report may need to be reassessed to check that they are still applicable.

This report is based on information obtained from the recently undertaken site topographical and buried utilities survey, and drainage record plans.

1.2. Scope

Our client Whitbread PLC has requested Booth-King Partnership Ltd. to undertake a flood risk assessment for Flood Zone 3a, a scheme drainage design and provide a drainage strategy for the purposes of planning permission with Kirklees Council for a conversion 20-bedroom Annex building, shown in Figure 1.

2. Existing Site

2.1. Location

The site is located at south of Bradford adjacent to Junction 26 of the M62 Motorway and surrounded by the Main Hotel to the northwest and the existing carpark and Stubs Beck Lane to the east, Dyehouse Drive to the north, and A58 to the south. The proposed development being 0.062ha and it is located at Ordnance Survey Grid Reference E: 418452, N: 426730.

A Site Location Plan can be found in Appendix A.

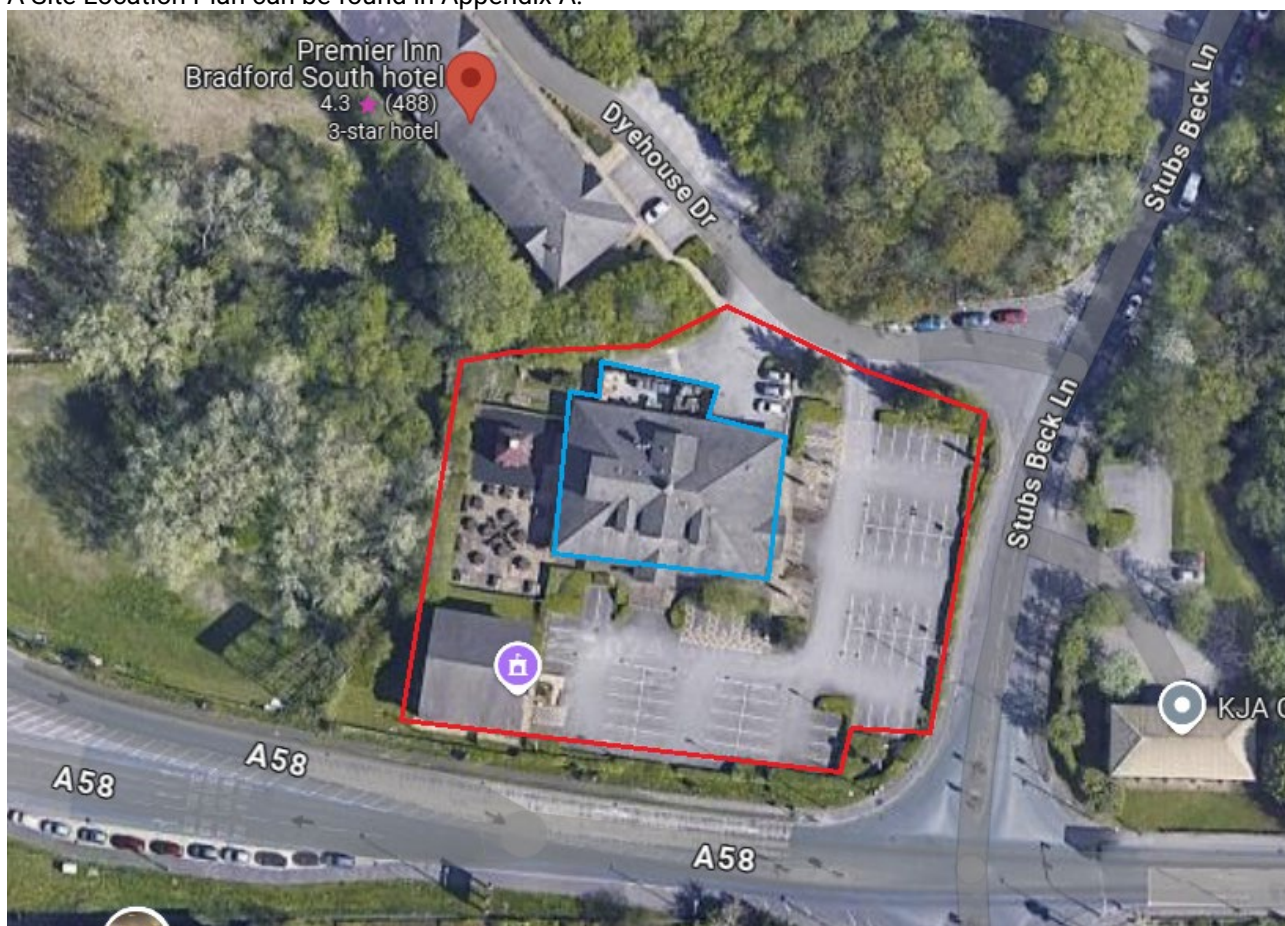


Figure 1. Existing Site

2.2. Site Levels

A topographic survey of the site has been completed and it shows that the site is relatively flat with a low level of 86.12m AOD at the northwestern boundary and the highest level of 86.49m AOD at the northeastern boundary. The south boundary level is levelled at 86.34m AOD.

2.3. Existing Drainage

Separate surface water network and foul water network are identified within the site boundary, servicing the public house and the Touchbase Meetings Conference/Business Centre. The existing surface water network appears to be travelling west towards the carpark to manhole MH with a minimum invert level of 84.94m before reaching an oil interceptor and finally discharging to a Yorkshire Water Asset on Stubs Beck Lane (marked in topographical survey).

The existing foul network appears to be travelling from the public house towards north, before discharging to a Yorkshire Water Asset on Dyehouse Drive with an invert level of 84.34m AOD.

The existing foul and surface network within the site is private and generally fall under gravity.

Anglian Water plans of public sewers identifies that there are two separate networks, a foul and a surface water. The Yorkshire Water Asset plan is included as Appendix B. The foul network flows to the east. Whereas the surface water network flows to the north of the development.

Refer to Appendix B for Yorkshire Water Asset Map and current drainage layout.

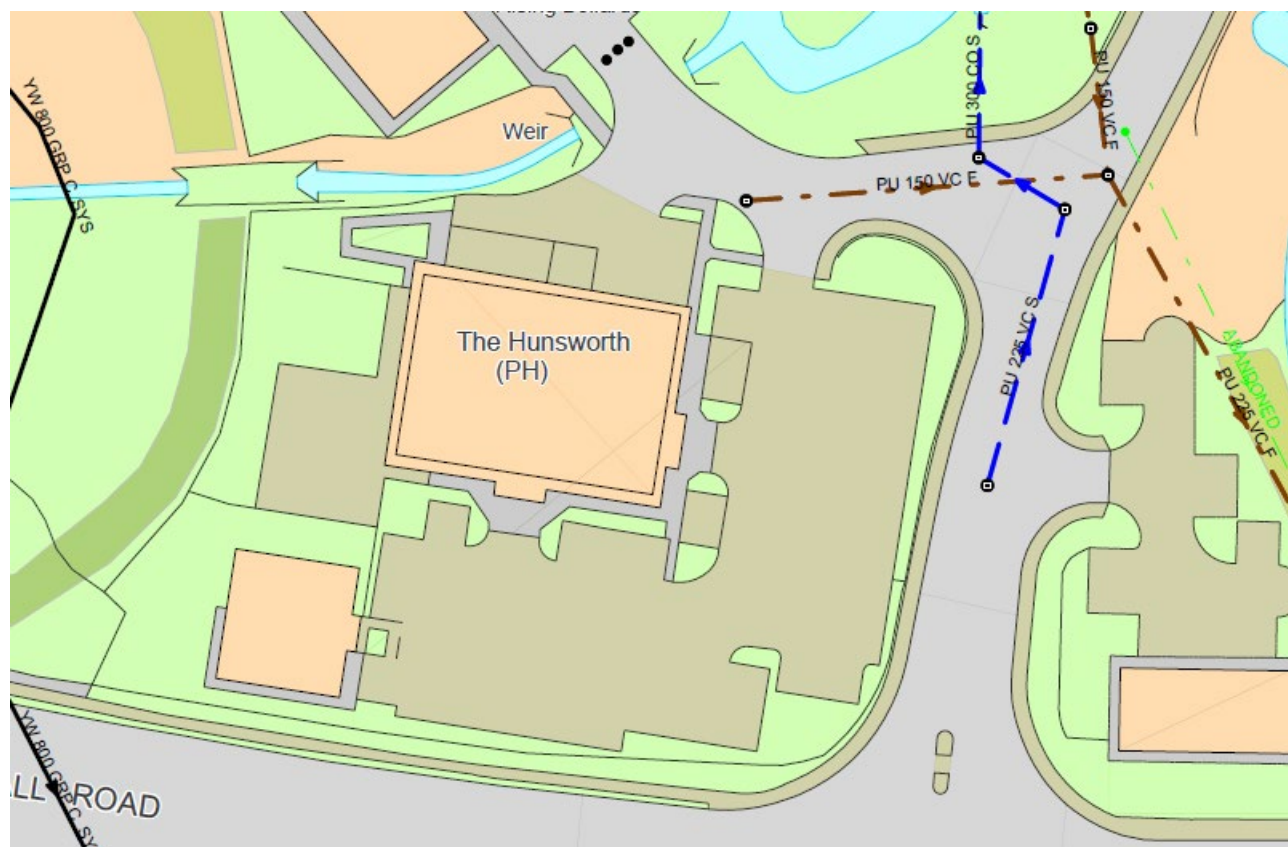


Figure 2. Yorkshire Water Maps Extract

2.4. Geology

A Ground Investigation was conducted in May of 2009 to support a previous application for an extension of the main hotel, and prepared by Northern Foundations Ltd document reference No: GI 9231 and states the following:

Made ground deposits were noted below the surface in all of the borehole and trialhole locations. The depth of made ground varied between 2.35m in borehole WS5, and 2.60m in trialhole TH2. Three of the boreholes were located in car park areas, and borehole WS4 and trialhole TH2 were located in a paved area; in these locations, below the surface layers, the upper made ground deposits were generally crushed stone with fines, clayey in parts; the depth of crushed stone varied between 0.35m and 0.40m in the car park, and between 0.70m to 0.80m depth in the paved area near the building. Borehole WS2 was located in a landscaped area; here, the surface layers contained topsoil with silt, gravel, sand and contained concrete and brick fragments.

Below the upper layers as described above, the made ground deposits were variable and were mainly found to contain generally 'firm' to 'stiff' sandy, gravelly clays and silts, with some organic content in parts and common carbonaceous shale and mudstone fragments. A significant base layer of generally 'loose', dark grey, gravel of carbonaceous shale and mudstone fragments, with occasional coaly fragments was noted in four of

the boreholes and in trialhole TH2. The thickness of this shaly gravel layer varied between 0.80m in borehole WS5 and 1.50m in borehole WS1, and it was noted from depths varying between 0.95m in borehole WS1 and 1.70m in borehole WS3.

In borehole WS4, the made ground deposits were notably different; generally 'very loose'/'firm' to 'soft' clays were noted below the surface gravel, with trace brick fragments and occasional possible organic horizons.

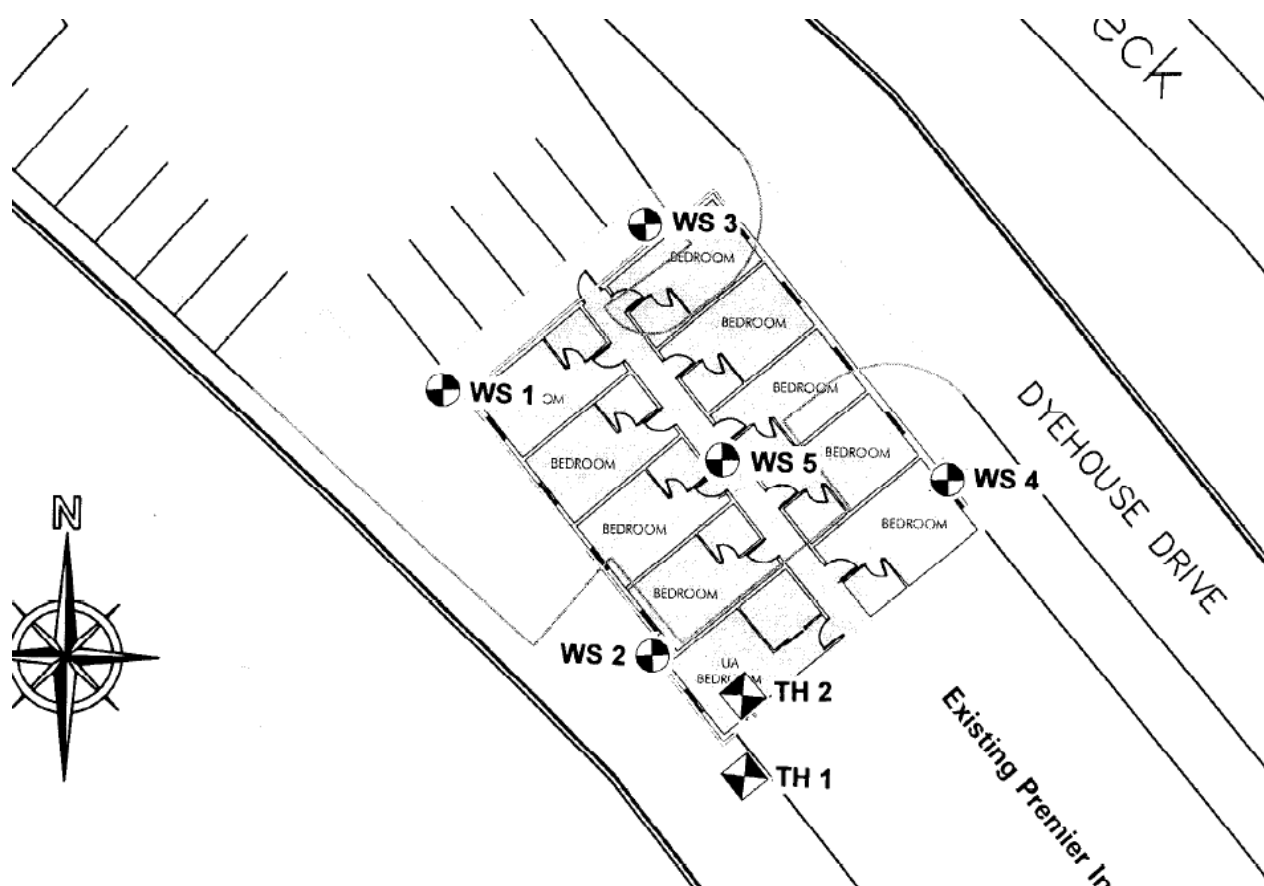


Figure 3. Boreholes & trialholes Extract from GI 9231

Natural Drift deposits:

Below the made ground layers, natural Drift deposits were found in all five of the boreholes, and trialhole TH2. A variable, yellow brown to orange grey brown, upper clay layer was noted in all of the locations (0.20m to 0.90m thick). This upper clay layer was generally 'soft' and 'firm' to the south west side of the site in boreholes WS1 and WS2 and trialhole TH2; and generally 'firm' to 'stiff' in boreholes WS3, WS4 and WS5, in the north east section of the site.

Below the upper clay layers as described above, the Drift deposits mainly comprised 'loose' to 'medium dense' gravels, and very gravelly sands and silts, from depths ranging between 2.80m and 3.4m. The gravel layers were variable in content and generally consisted of silty sandy gravels of sub-angular to sub-rounded sandstone, mudstone and siltstone fragments, with occasional large cobbles, and with sections of very gravelly sands and silts. Groundwater entries were generally noted within the gravels. These gravel layers were generally noted to the total depth of the four deeper boreholes at 5.00m. Borehole WS2 was terminated with a refusal at a depth of 2.90m, with a SPT value greater than 50 blows, possibly on a large sandstone cobble or boulder.

During the site excavation works, groundwater was noted in three of the deeper boreholes and trialhole TH2.

2.5. Hydrogeology

According to Ordnance Survey Mapping, the closest surface water feature is Stubs Beck, which flows through the site and splits into two sections. Hudsworth Beck is situated 52.0 meters to the north of the development, across the access road to the hotel.



Figure 4. Extract from Product 4 Flood Maps

2.6. Source Protection Zone

The site lies outside Source Protection Zones.

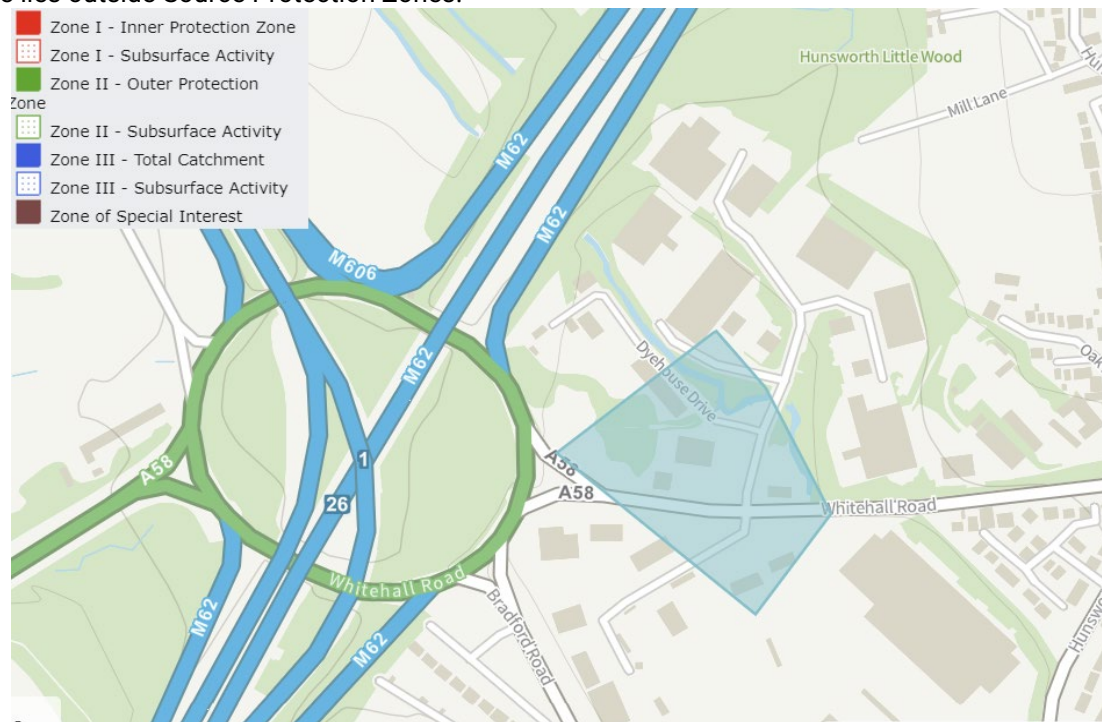


Figure 5. Magicmap Extract

The site is not located within a Special Area of Conservation (SAC) or Special Protection Area (SPA).

3. Flood risk

The Environment Agency Product 4 Maps indicate that the site is predominately within Flood Zone 2 with a small part of the access Road to the hotel in Flood Zone 3. The flooding is associated with flooding River Spen, Stubs Beck and Hunsworth Beck.

The vulnerability of the site to flooding from rivers and other sources has been considered and the local SFRA has been taken into account. Typical sources of flooding include fluvial, tidal, surface water, groundwater and anthropogenic sources such as sewer flooding and reservoir flooding. These are all considered in this Section.

3.1. Sequential and Exception Test

The probability of flooding from rivers and the sea is modelled by the EA for the whole of the UK and mapped as Flood Zones which categorise areas according to the likelihood of flooding occurring. The zones are defined by the predicted extent of flooding during annual exceedance probability (AEP) events.

The maps are based on a broad assessment of areas using digital mapping techniques. Extracts from the EA flood maps for the site and its surroundings are included here for reference purposes.

The flood zones are defined In Table 3.1 of the NPPF and Kirklees Publication Draft Local Plan Technical Paper: Flood Risk (issued November 2011) as follows:

Flood Zone	Definition
Zone 1 – Low Probability	Lowest risk of flooding (less than 1 in 1000 probability per year)
Zone 2 – Medium Probability	Medium risk of flooding (between 1 in 1000 and 1 in 100 probability per year).
Zone 3a – High Probability	High risk areas (usually between 1 in 100 and 1 in 20 probability of flooding in any year).
Zone 3ai – High Probability	Areas which are already developed but have the same risk as Flood Zone 3b (1 in 20 probability per year).
Zone 3b – The Functional Floodplain	The undeveloped functional floodplain where it is desirable for water to be stored in times of flooding (usually greater than 1 in 20 probability of flooding in any year but also including areas which are designed to flood).

The Sequential Test concluded there to be no other reasonably available alternative sites in areas at lower probability of flooding, that would be appropriate for the development for the nature of development proposed, or which would be sequentially preferable to application site.

Based on the above, one would conclude that the development has passed the Sequential Test.

The Strategic Flood Risk Assessment: Flood Map (below) places the proposed development in the Flood Flood Zone 2.

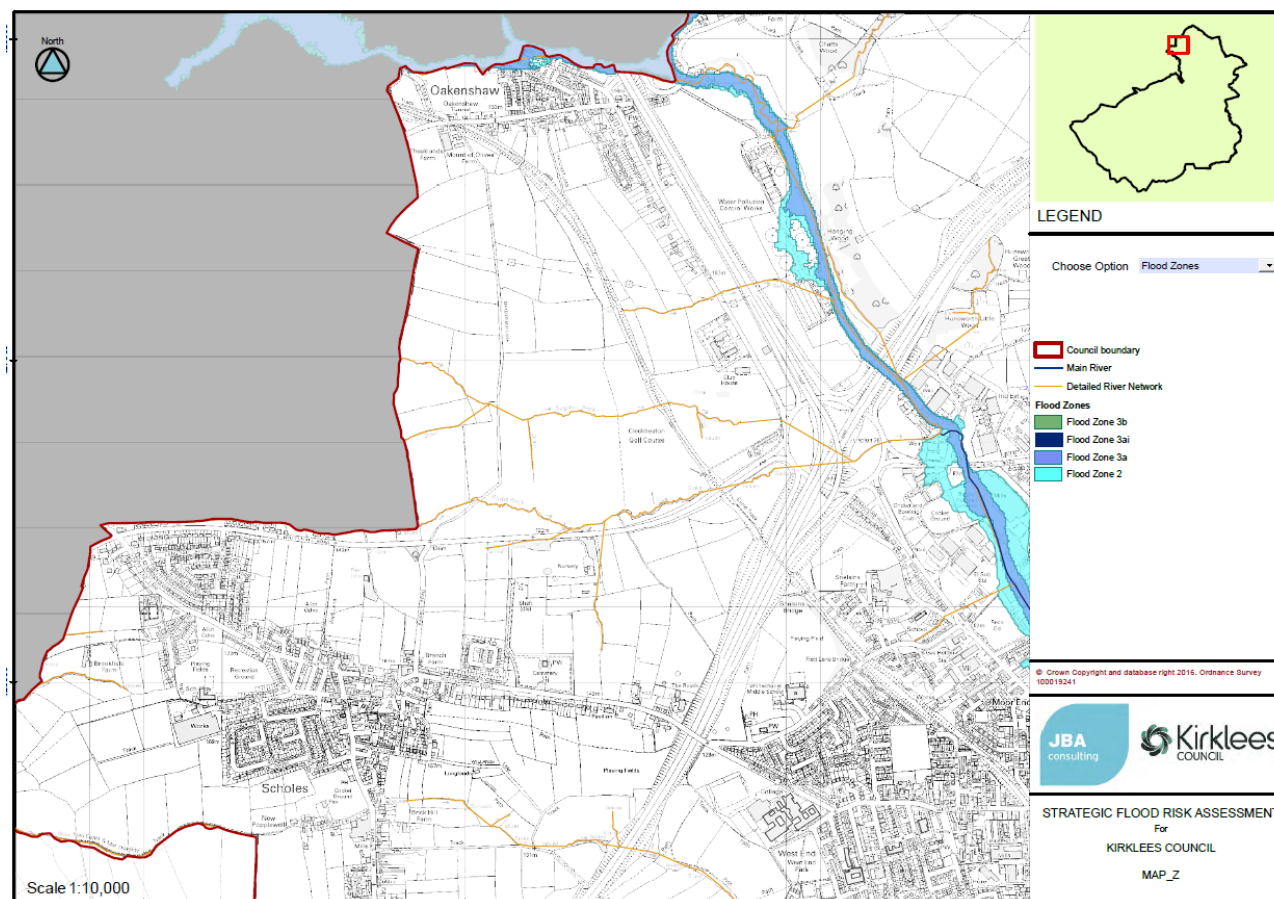


Figure 6. Extract from SFRA Map - Strategic Flood Risk Assessment

Flood Risk Vulnerability and Flood Zone Incompatibility

Table 2 of the NPPF classifies the compatibility of different development end uses, based on their vulnerability to flooding, against the defined flood zones for rivers and sea, and an extract of the table is provided below.

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 †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key: ✓ Development is appropriate, ✗ Development should not be permitted.

* 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.

The NPPF defines the Flood Risk Classifications within Annex 3, and the definitions are not repeated here. The proposed development is a residential accommodation in the form of hotel rooms (more vulnerable); therefore, an Exception Test is not required according to the table above.

Kirklees will be ideally placed to encourage inward investment and stimulate economic growth. This will be achieved through the provision of new prime employment land, sites of strategic importance for employment with a focus on manufacturing and engineering including Whitehall Road, Cleckheaton and Chidswell and safeguarded employment land which, as a whole, provide the opportunities to grow businesses, improve economic resilience and increase the district's ability to compete with other areas, economic benefits of housing delivery and the potential to reduce out-commuting.

Figure 7. Extract Local Plan 2013 to 2032

Kirklees Council, as the Leading Planning Authority (LPA), should seek to avoid inappropriate development in areas at risk of flooding by directing development away from areas at highest risk and ensuring that all development does not increase risk and where possible can help reduce risk from flooding to existing communities and development.

At a strategic level, this should be carried out as part of the allocation of sites for development during the Local Plan, by applying the risk-based approach to the allocation of development to avoid flood risk to people and property and manage any residual risk, taking account of the impacts of climate change. This should be done by:

1. Applying the Sequential Test and if the Sequential Test is passed, applying the Exception Test.
2. Safeguarding land from development that is required for current and future flood management; and
3. Using opportunities offered by new development to reduce the causes and impacts of flooding.

Following Figure 4-2: Local Plan Sequential Approach to Allocation (page 34) in Strategic Flood Risk Assessment - Volume II Kirklees Council (Final Report, July 2016) (SFRA Level 2)

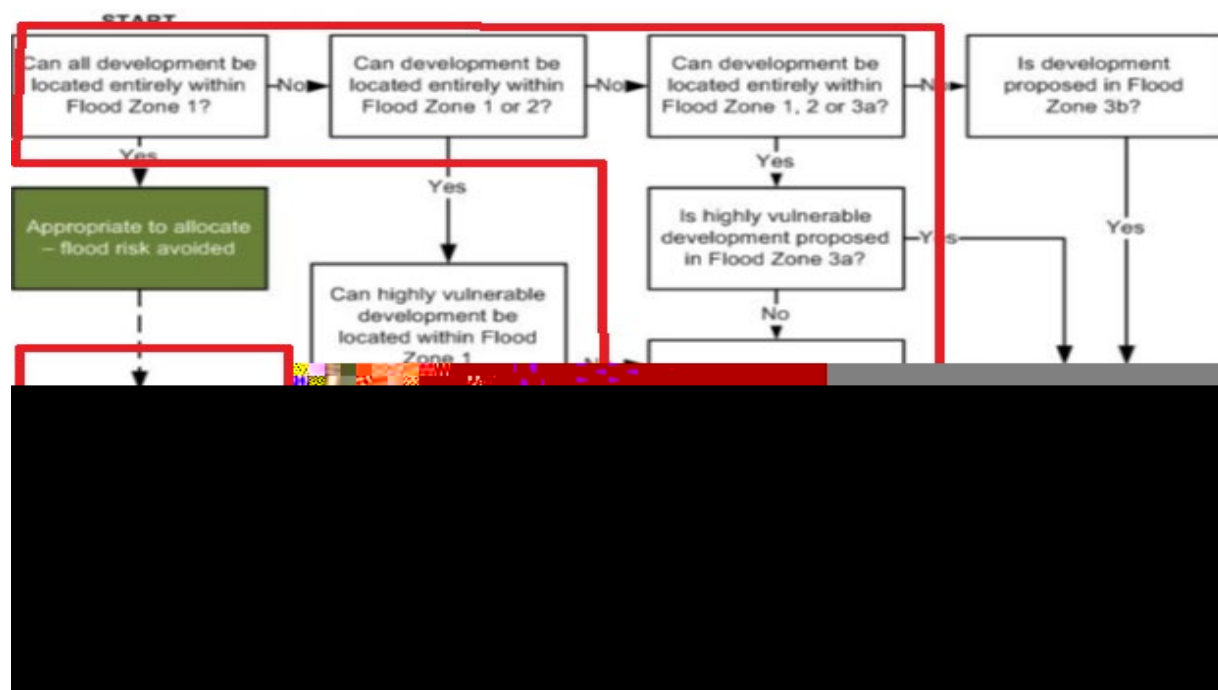


Figure 7. Extract SFRA Level 2

One can conclude from the above figure, that a sequential test is not required.

3.2.Flooding from River/Fluvial Flooding

The site is currently located within an area defined as Flood Zone 2 and is considered to benefit from flood defences located to the south of the site protecting it from flooding by River Spen.

The Environment Agency 'Product 4' maps show several scenarios of flooding to the site from Hunsworth Beck influenced by River Spen. The EA Node Point Maps are presented in Appendix C.

No historic flooding has been recorded for the overall site.

The Flood map shows that the development is in risk of flooding in the 1 in 1000-year event. Point No: 1 is the closest to the site/development. There is no flooding in the 1 in 100-year event.

Table 3.1 Modelled node locations date: Defended.

Modelled node locations data

Defended

Label	Modelled location ID	Easting	Northing	1% AEP	1% AEP
				Level	Flow
1	261292	418482	426769	85.09	17.41
2	154256	418522	426779	84.66	17.39
3	27451	418539	426773	83.85	17.39
4	202371	418546	426738	83.50	17.38
5	45061	418560	426690	83.36	17.35
6	115207	418701	426317	80.37	17.22
7	249657	418720	426287	80.14	17.21

Table 3.2 Modelled node locations date: Defences removed

Modelled node locations data

Defences removed

Label	Modelled location ID	Easting	Northing	4% AEP	2% AEP	1.33% AEP	1% AEP	0.1% AEP
				Level	Level	Level	Level	Level
1	261292	418482	426769	84.85	84.97	85.04	85.09	86.91
2	154256	418522	426779	84.44	84.55	84.61	84.66	86.94
3	27451	418539	426773	83.69	83.77	83.81	83.85	86.74
4	202371	418546	426738	83.23	83.36	83.44	83.50	86.74
5	45061	418560	426690	83.06	83.20	83.29	83.36	86.73
6	115207	418701	426317	80.06	80.22	80.31	80.37	81.35
7	249657	418720	426287	79.86	80.0	80.09	80.14	80.97

Data in this table comes from the 2009 FIM River Spen model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.
If no level or flow data is available for a scenario, no table will be shown.

Table 3.3 Modelled node locations date: Defences removed with 20% climate change.

Modelled node locations data

Defences removed climate change

Label	Modelled location ID	Easting	Northing	1.0% AEP (+20%)	1.0% AEP (+20%)
				Level	Flow
1	261292	418482	426769	85.47	20.89
2	154256	418522	426779	85.15	20.74
3	27451	418539	426773	84.88	20.70
4	202371	418546	426738	84.91	20.49
5	45061	418560	426690	84.88	20.30
6	115207	418701	426317	80.63	20.30
7	249657	418720	426287	80.37	20.30

Data in this table comes from the 2009 FIM River Spen model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.
If no level or flow data is available for a scenario, no table will be shown.

Table 3.4 Sample point: Defences removed

Sample point data

Defences removed

Label	Easting	Northing	2% AEP	1.33% AEP	1% AEP	0.1% AEP
			Depth	Depth	Depth	Depth
1	418397	426684	NoData	NoData	NoData	NoData
2	418423	426684	NoData	NoData	NoData	0.03
3	418449	426684	NoData	NoData	NoData	0.51
4	418475	426684	NoData	NoData	NoData	0.41
5	418501	426684	NoData	NoData	NoData	0.45
6	418397	426710	NoData	NoData	NoData	NoData
7	418423	426710	NoData	NoData	NoData	0.49
8	418449	426710	NoData	NoData	NoData	0.66
9	418475	426710	NoData	NoData	NoData	0.60
10	418501	426710	NoData	NoData	NoData	0.90
11	418423	426736	NoData	NoData	NoData	NoData
12	418449	426736	NoData	NoData	NoData	0.39
13	418475	426736	NoData	NoData	NoData	0.60
14	418501	426736	NoData	NoData	NoData	0.31
15	418423	426762	NoData	NoData	NoData	NoData
16	418449	426762	NoData	NoData	NoData	NoData

Points 8, 9, 11, 12, and 13 were chosen as they are relevant to the development.

Given that current site levels are at approximately 86.32mAOD and existing finished floor levels at 86.41m AOD, the EA modelled fluvial data indicate that the flood depths would not cause a significant threat to life for the 1 in 100 year event.

Based on the above tables, the development is only at risk of flooding in the 1 in 1000-year event with a flood level of 86.91m AOD. 500mm above the existing finished flood levels.

3.3.Flooding from Sea/ Tidal Flooding

The development is considered to be at risk from tidal flooding.

3.4.Proposed Mitigation

The ground floor level of the proposed annex will be set at 86.41m AOD, which is raised approximately 150mm to 200mm compared to existing surrounding ground levels. In addition, 600 mm flood barriers will be included within the design, taking the height of flood protection to 86.91m AOD. This takes into account the worst-case existing flood depth on site in the event of a 1 in 1000-year on the 2009 FIM River Spen levels.

The following levels have been considered when setting the standard of flood protection for the site:

- 86.25m AOD existing ground levels.
- 86.91m AOD - level of flooding based on 2009 1 in 1000-year event

It is recommended that flood resilient construction measures are incorporated within the proposed development to 600mm protecting the development from the potential depth of flooding on site.

The site will be registered with the Environment Agency's flood warning system and a Flood Management Plan has been produced for the site. Based on the six hour warning available from the time storm surge passes around the eastern coast of Scotland and down along the English coast, the warning would be sufficient for the Flood Management Plan to be implemented. In addition, high tides are predictable and in the event of a storm surge and meteorological conditions occurring, such events are typically highly publicised within the media, and as such significant warning times are available.

The flood warning will allow the rooms on the ground floor to be relocated and control measures to not fill the ground floor rooms will be put into place on the Premier Inn central booking. The flood warning will allow sufficient time for the demountable flood barriers to be put into place. Based on the development proposals compared to the previous application there will be more time to remove guests from the ground floor as there was no requirement to vacate previously and as such no plans were put into place.

In summary, based on the flood warning available for the site, the residual risk associated with fluvial flooding and the infrastructure which Premier Inn has in place for other sites, it is proposed that in the event of a flood warning the ground floor will be vacated. This would ensure that there are no occupants within the sleeping accommodation on the ground floor. Based on the Annex being built over multiple stories, it is considered there is sufficient refuge in the upper floor to provide a safe haven for occupants or to be moved to the upper floors of the Main Hotel building.

3.5. Surface Water Flooding

The EA's surface water flood map shown in Figure 4 shows the flooding risk is very low for most of the site, however along the south boundary, there are areas that are identified as high risk.

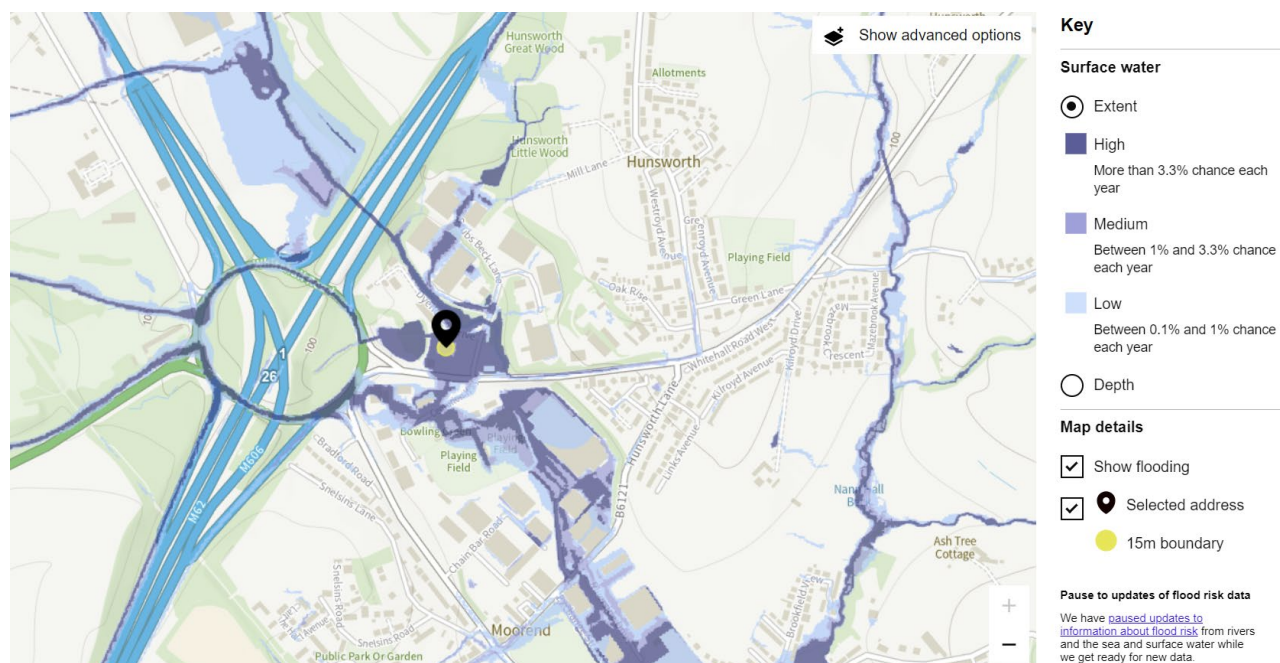


Figure 8. EA - Surface Water Flooding

This can occur during intense rainfall events, when water cannot soak into the ground or enter drainage systems. Surface water flooding from on-site sources is considered in Section 5 of this report.

The proposed ground floor levels of the hotel and restaurant are raised above the surrounding ground levels and as such will suitably mitigate the risk of flooding from overland flow.

3.6. Groundwater Flooding

According to the Ground Investigation GI9231, during the site excavation works, groundwater was noted in three of the deeper boreholes and trialhole TH2. Where noted, the groundwater entry levels varied between 2.50m in trialhole TH2, and 2.90m in borehole WS5. The noted final observed standing water levels varied between depths of 2.63m in borehole WS4 and 3.91m in borehole WS3. A monitoring standpipe was installed in borehole WS1 which indicated a standing water level of 2.64m during the drilling works, and a standing water level of 2.76m (approximate survey datum level 84.67m) was measured in the standpipe during a return visit to site on the 23rd of April 2009.

It appears that the some of the groundwater entered the boreholes from the lower gravel strata; the groundwater appeared to be under some sub-artesian pressure in parts, as its level rose up the boreholes. Accordingly, some dewatering should be anticipated should deep excavation work be undertaken. In particular, should excavations be taken below the top of the gravels, then we would expect that some form of groundwater control would be required.

It should be noted that the above comments are only based on observations noted during the course of one day of site work and on a single return monitoring visit to the site. Longer term monitoring of the groundwater levels with deeper standpipes would help to provide a more accurate assessment of the groundwater conditions on the site.

Groundwater levels are likely to vary seasonally. Accordingly, groundwater levels may be higher over wet weather periods or lower in dry periods and may fluctuate according to local weather conditions.

3.7. Flooding from Anthropogenic Sources

Flooding from a reservoir and can occur from as a result of a dam failure. Reservoir flooding will cause very fast flowing water to flow down the natural water path in large quantities. Reservoir flooding is extremely rare in the UK due to very strict regulations and mandatory assessments

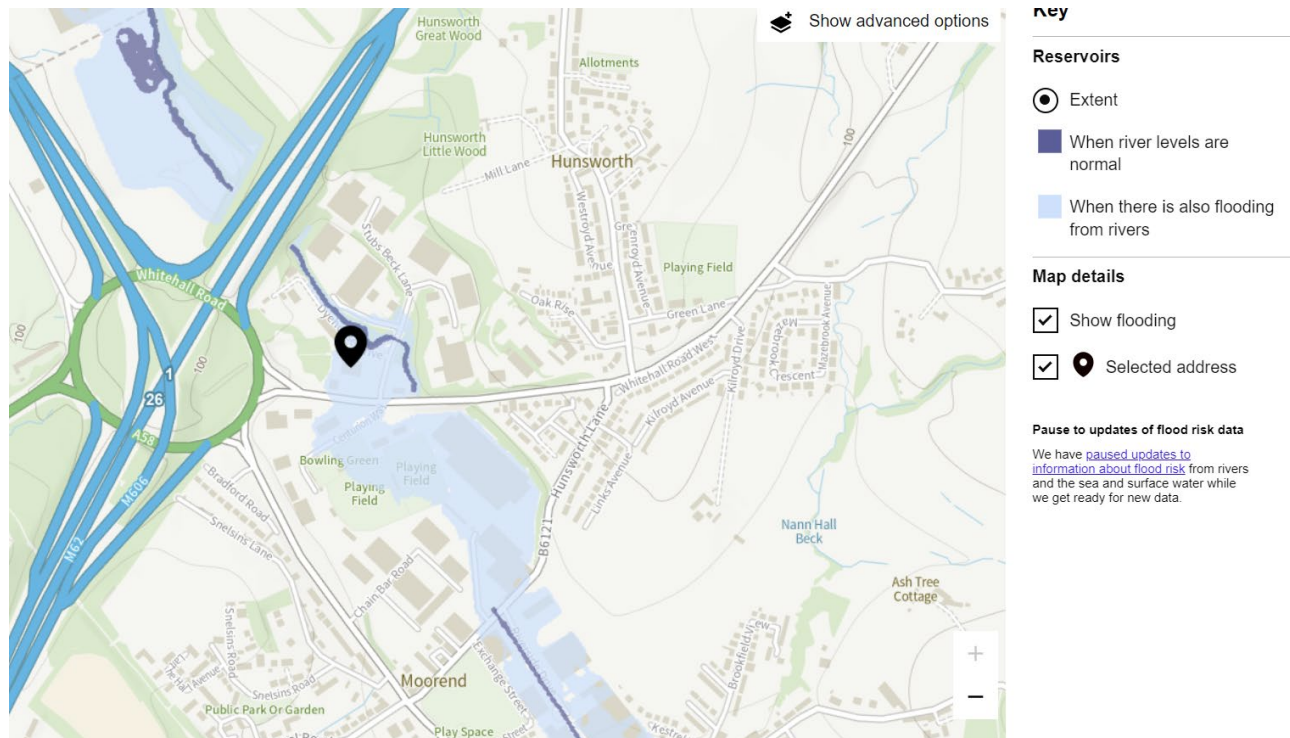


Figure 9. Extract from <https://check-long-term-flood-risk.service.gov.uk/map?eastings=418455.08&northing=426731.01&map=Reservoirs>

The development will not experience flooding from a reservoir breach. The flooding shown above, as indicated in the key, refers to flooding from rivers as well.

4. Surface Water

In accordance with the NPPF and SFRA, consideration should be given to natural water flows at the site. The development should not adversely affect flow or increase flood risk elsewhere, including increasing run-off rates. The disposal of surface water should be dealt with in a sustainable way and climate change should also be accounted for. The site drainage strategy is discussed in Section 5.

4.1. Development Proposals

A Proposed Site Layout has been provided by Alison Pike Architects and it is understood that the site is to convert the existing public house to be developed for use as an Annex to the current Premier Inn hotel and will comprise 20-bedrooms with a smaller restaurant on the ground floor.

4.2. Climate Change

There is evidence to suggest that the climate is changing with sea levels predicted to continue to rise along with more frequent short-duration, high-intensity rainfall and more frequent periods of long-duration rainfall. The NPPF recommends that the effects of climate change be accounted for in FRA, with consideration of the EA flood maps and local authority SFRA.

Increased rainfall or higher intensity short-duration rainfall may increase as a result of climate change. The Department for Environment Food & Rural Affairs have developed an interactive map and requires all new development to allow for a 40% increase in rainfall to allow for climate change for the Louth Grimsby and Ancholme Management Catchment peak rainfall allowances.

A 40% increase is therefore being allowed for within the new surface water drainage design to take account of climate change. Climate change may also lead to variations in groundwater level which will also be considered during the drainage design.

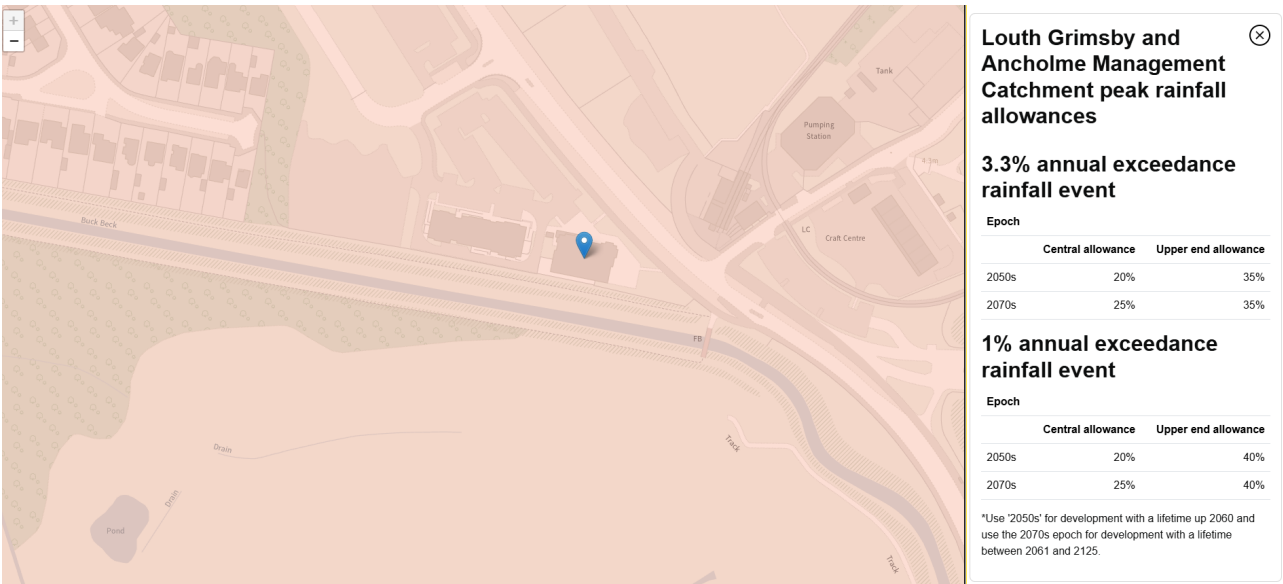


Figure 10. Climate Change Allowance Interactive Map

4.3. Sustainable Drainage Systems (SuDS)

SUDS are a desirable way to manage surface water disposal within new developments and SUDS methods for surface water drainage management are discussed further within the SUDS Manual.

The types of benefits that can be achieved by SUDS will be dependent on the site, but fit broadly into four categories: water quantity, water quality, amenity and biodiversity. These are also referred to as the four pillars of SUDS design (Figure 8):

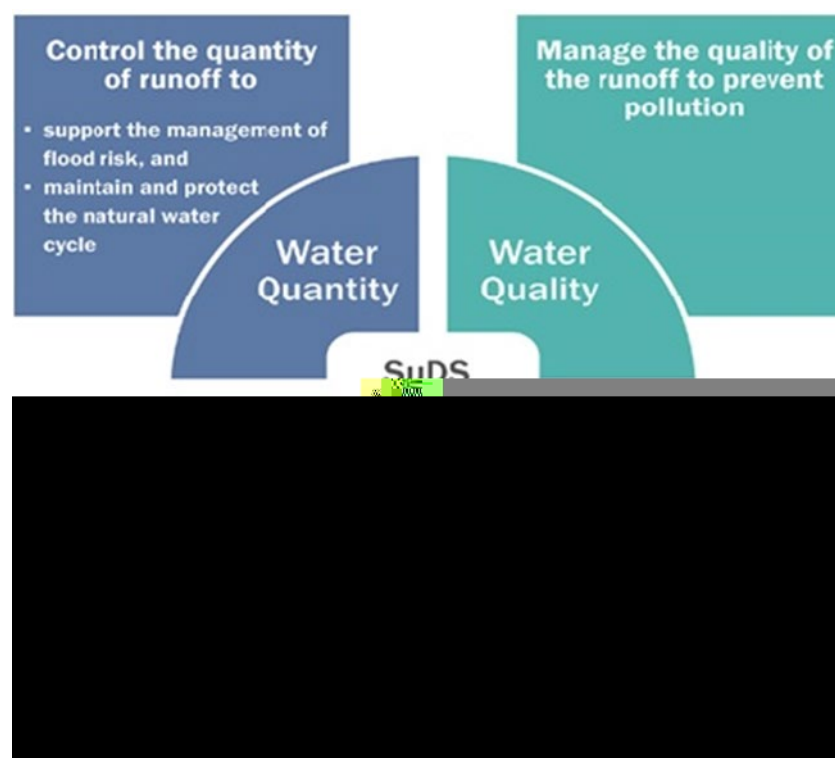


Figure 11. Four Pillars of SuDS

The proposed development will address the above 4 pillars of SuDS design criteria with the inclusion of a range of sustainable features through a comprehensive treatment train.

- **Water Quantity:** the quantity of run-off from the site will not be altered as the development is a conversion of the existing public house, as set out in more detail in the Drainage Strategy in Section 5.
- **Water Quality:** The quality of runoff from the site is enhanced by the inclusion of an oil interceptor. Rainwater from the building roof will first be treated through a network of existing pipes. All runoff will be collected on-site before being discharged into the Yorkshire Water Asset manhole, located just off the site boundary.
- **Biodiversity** will be addressed by a small increase in the existing green areas and vegetation areas around the site, as well as by the inclusion of a significant planting regime creating a better environment for nature to thrive.
- **Amenity** is provided through the proposed green areas, which presents the opportunity to create visually attractive areas within the proposed site which have the ability to connect people to water. Such features have been shown to improve the well-being of people that live within the proposed development.

5. Drainage Strategy

It is proposed to convert the existing public house to a new 650m² Annex with a smaller restaurant, refer proposed drainage general arrangement for layout and details provided in Appendix D.

5.1. Proposed Foul Water Network

It is proposed to reuse existing pop-up positions within the current layout and in part install a new gravity system local to the newly converted rooms, the runs will be kept to a minimum depth and concrete encased (where required) so as to allow connection into the closest existing foul manhole. With reference to British Water Flows and Loads 4, flows for the additional rooms and decreased restaurant size will reduce site peak foul discharge from 0.39 l/s

British Water - Flows and Loads 4					
Hotel - Total - PROPOSED	Rooms (2 person)	No.	FLOW (L)		
Hotel Guests (3*)	20	40	250	10000	
Hotel full time day staff		10	90	900	
Hotel part time staff		10	45	450	
Restaurant	20	2	30	1200	
Drinkers (allow)	20	1	12	240	
Toilets (WC) per use - allow 1 per cover	20	1	10	200	
Toilets (Urinal) per use, allow 2 per drinker	20	2	5	200	
Restaurant full time day staff (per day)		5	90	450	
Restaurant part time staff (per day)		5	45	225	
			Total	13865	litre/d ay
			Peak flow (total/10hr/60/60)	0.39	l/s
			Average flow (total/24hr/60/60)	0.16	l/s

Figure 12. Flows and loads – Estimate Proposed Site Foul Volume

Drainage Strategy drawings can be found in Appendix D.

5.2. Proposed Surface Water Network

No modifications will be made to the existing surface water network, as the development involves the conversion of the current public house. The existing rainwater pipes will be used to collect runoff from the roof.

6. Conclusions & Recommendations

6.1. Conclusions

This Flood Risk Assessment follows guidance set out in the NPPF and the 'Planning Practice Guidance – Flood Risk and Coastal Change' and follows Environment Agency Guidance Note 1.

A review of the EA Indicative Flood Mapping and other relevant data indicates that the site is located within a tidally defined Flood Zone 2 and Flood Zone 3 associated with River Spen and Hunsworth and Stubs Beck.

There are no historical flood events recorded for the site.

Given that current finished floor levels are at approximately 82.41m, the EA modelled fluvial data indicate that undefended flood depths for most of the storm event if the present flood defences were not present, the flood risk to the site would cause a significant threat to life with flood depths.

The risk of flooding for the development is presented only in the 1 in 1000-year event. It is recommended that flood resilient construction measures are incorporated within the proposed development to 600mm protecting the development from the potential depth of flooding on site.

No modifications will be made to the existing surface water network, as the development involves the conversion of the current public house. The existing rainwater pipes will be used to collect runoff from the roof.

6.2. Recommendations

- FFLs are set 86.41m AOD.
- It is recommended that the site owners sign up to the EA Flood Alert and Warning Scheme and consultation undertaken with the Council's Emergency Planner.
- It is recommended that a detailed drainage design is conducted along with consultation with Yorkshire Water determine the disposal of foul water from the development.

7. Maintenance Plan

The Drainage network has been designed with minimal maintenance in mind. The maintenance is generally of a 'common sense' approach and is to comprise:

- Regular day to day care: - litter collection, grass cutting and checking the inlets and outlets where water enters or leaves a drainage feature.
- Occasional tasks: - managing vegetation in wet areas and removing any silt that builds up in the drainage features.
- Remedial work: - repairing damage when, and where, necessary.

Specific recommendations for each feature are provided in the following sections and should be referred to in the first instance if there are any issues. Please contact Booth King Partnership Ltd. if any further advice is required.

During the works the Contractor, subject to agreement from their client, will ensure that all drains on which the proposed drainage works rely will be jetted out and made good as required to ensure correct operation.

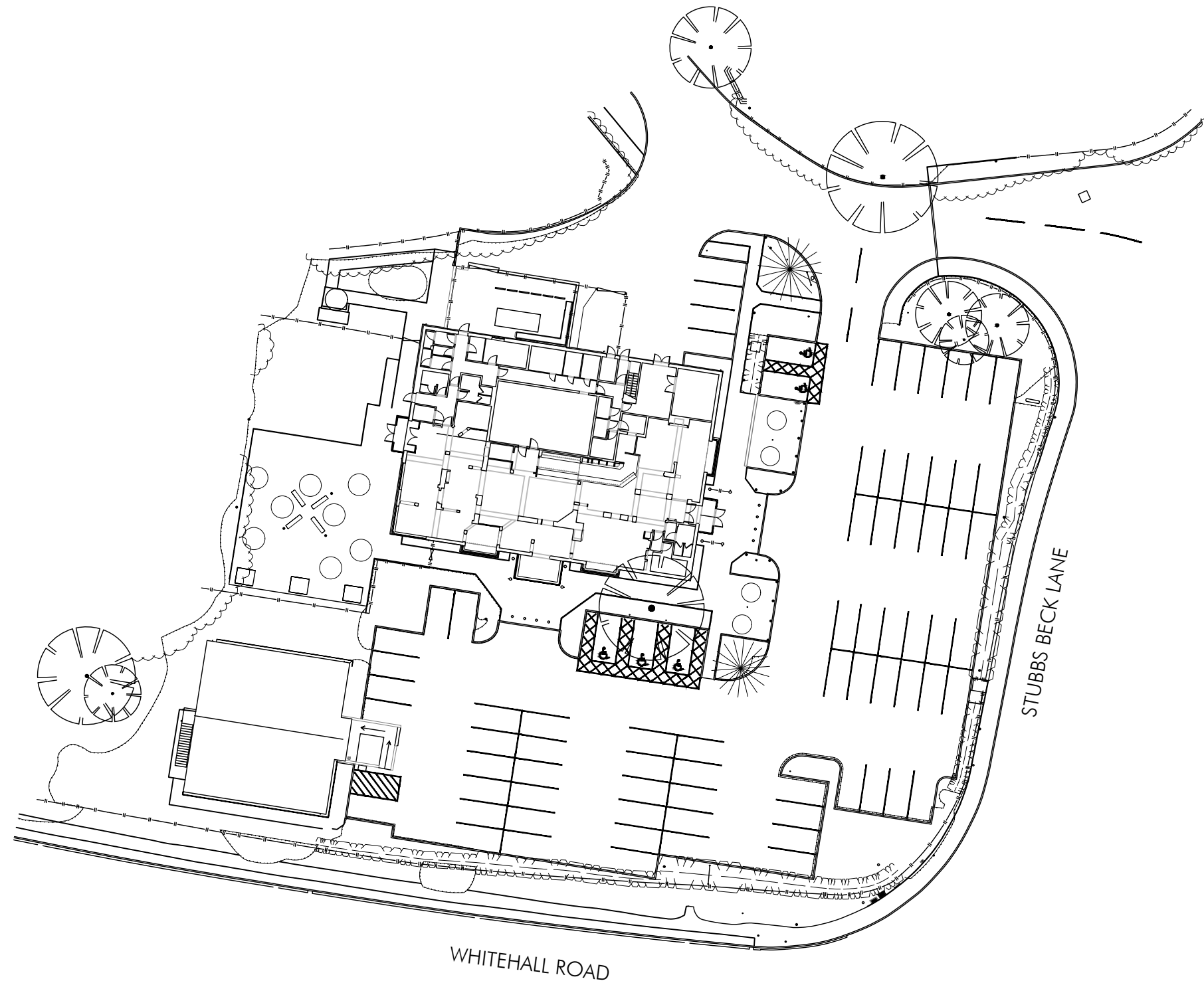
Maintenance Activity	Required Action	Frequency
Inspection	Inspect for sediment and debris in pre-treatment component such as gullies, sump units and catch pits.	Monthly for the first year and on a 6-monthly basis thereafter.
Gutters	Clear gutters and any leaf guards.	On a 6-monthly basis or as required following inspection regime.
Sump Units	Remove all obstructions and debris from all sump units (gullies, channels and catch pits).	On a 6-monthly basis or as required following inspection regime.
Pipe Work	Inspect all pipework for all silt accumulation and high pressure jet any pipe work which has silt accumulation. Care is to be taken that any silts within the pipework are not flushed using chamber bungs.	On a 6-monthly basis or as required following inspection regime.
Manholes	Covers should be lifted and inspected for litter and debris to ensure that the runs are free flowing.	On a 6-monthly basis or as required following inspection regime.
Oil Interceptor (existing)	It is advisable to have an accredited professional service your oil interceptor at least every three to six months. However, that should be increased in the event of heavy rain (which may flood your interceptor or cause extra contaminants to be washed in) or in areas where there are particularly high levels of traffic.	6 monthly basis. After extreme events.

8. References

1.	C753. The SuDS Manual. CIRIA. 2015.
2.	Planning Practice Guidance. http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/
3.	National Planning Policy Framework. March 2012.
4.	Environment Agency Indicative Flood Mapping
5.	Topographical survey.
6.	Calder Catchment Strategic Flood Risk Assessment Volume 1. Final Report April 2016
7.	Calder Catchment Strategic Flood Risk Assessment Volume 2. Final Report July 2016
8.	Kirklees Publication Draft Local Plan Technical Paper: Flood Risk November 2016
9.	Kirklees Surface Water Management Plan January 2011
10.	Kirklees Council - Employment Land Supply Review 2019
11.	Ground Investigation by Northern Foundations Ltd document reference No: GI 9231
12.	EA: Accounting for residual uncertainty: updating the freeboard guide. Report – SC120014
13.	Code of Practice Flows and Loads – 4 Sizing Criteria, Treatment Capacity for Sewage Treatment Systems

APPENDIX A

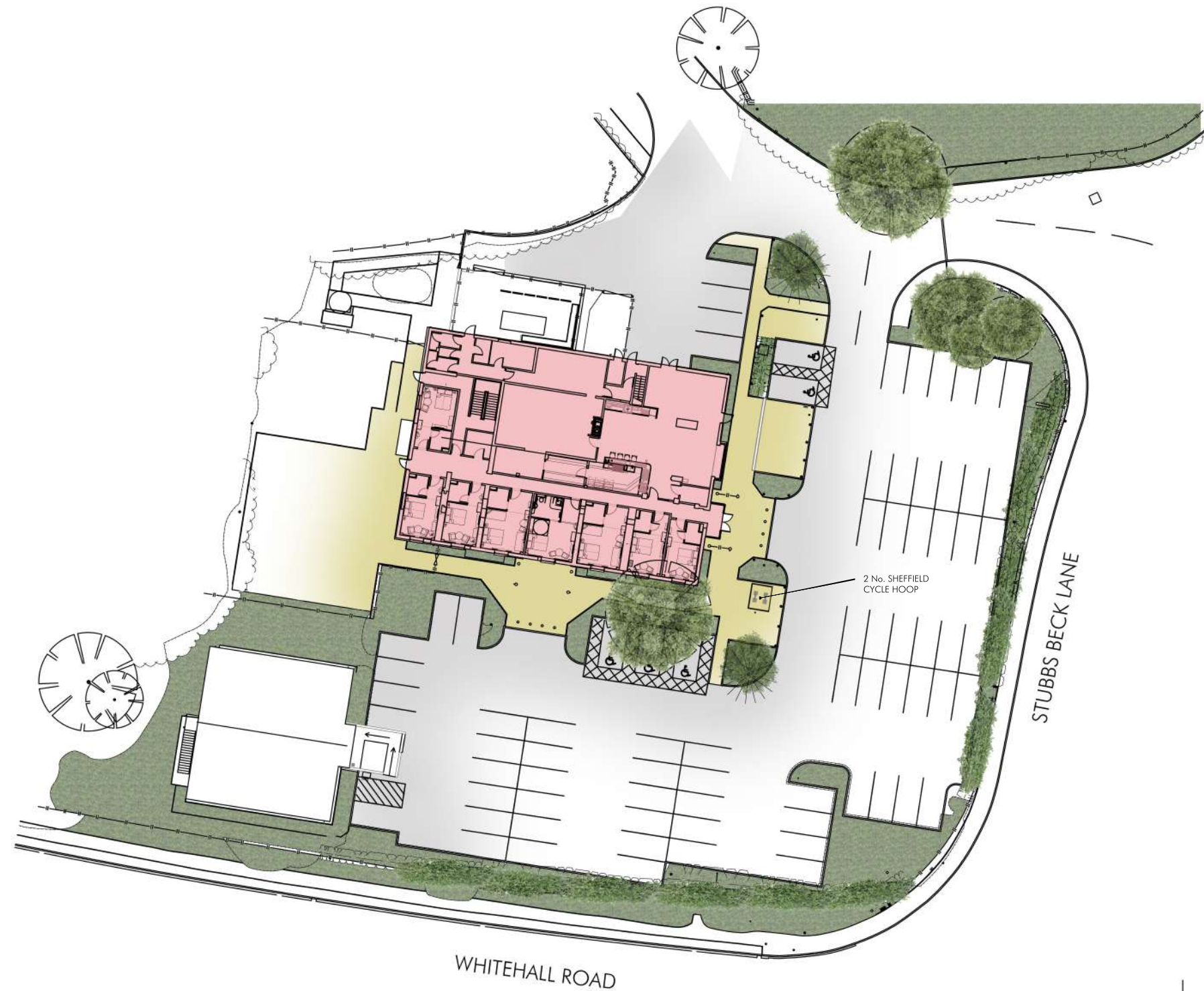
LOCATION PLAN – ARCHITECT’S PROPOSED DEVELOPMENT



EXISTING SITE PLAN
1:500



AM DRAWN	DRAWN REVISION	30/10/24 DATE	VER
PROJECT PREMIER INN EXTENSION, BRADFORD SOUTH		AP ALLISON PIKE ARCHITECTS & DESIGNERS 7 Buxton Road West, Disley, Stockport, Cheshire, SK12 2AE. Telephone: 01663 763000 Facsimile: 01663 766772 Website: www.allisonpike.com © Allison Pike Partnership Limited.	
TITLE EXISTING SITE PLAN AS SURVEYED			
SCALE 1:500 @ A3			
JOB No PI1125	DRAWING No AP01		



PROPOSED SITE PLAN
1:500

0 10m 20m 30m 40m 50m
SCALE 1:500 IN METRES



AM	REV A: 2 No. SHEFFIELD CYCLE HOOP LABEL ADDED AND GARDEN TABLES REMOVED			
AM	DRAWN		30/10/24	VER
DRAWN	REVISION		DATE	
PROJECT PREMIER INN EXTENSION, BRADFORD SOUTH			 ALLISON PIKE ARCHITECTS & DESIGNERS	
TITLE PROPOSED SITE PLAN				
SCALE 1:500 @ A3				
JOB No PH1125	DRAWING No AP03	REV A	7 Buxton Road West, Disley, Stockport, Cheshire, SK12 2AE. Website: www.allisonpike.com	
			Telephone: 01663 763000 Facsimile: 01663 766772 Email: studio@allisonpike.com © Allison Pike Partnership Limited	

APPENDIX B

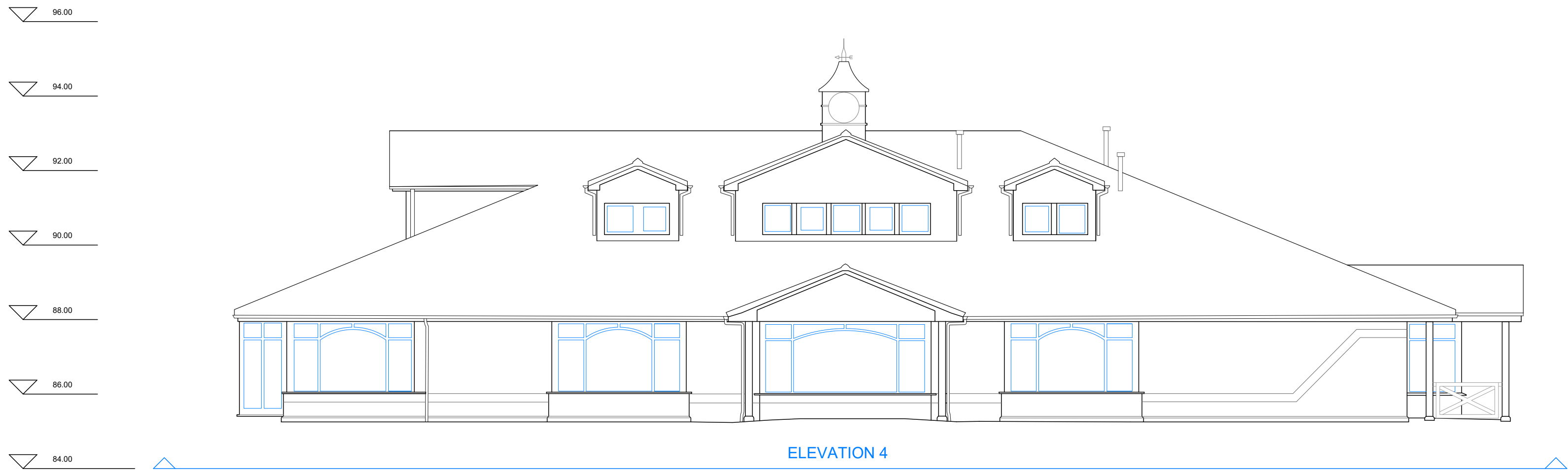
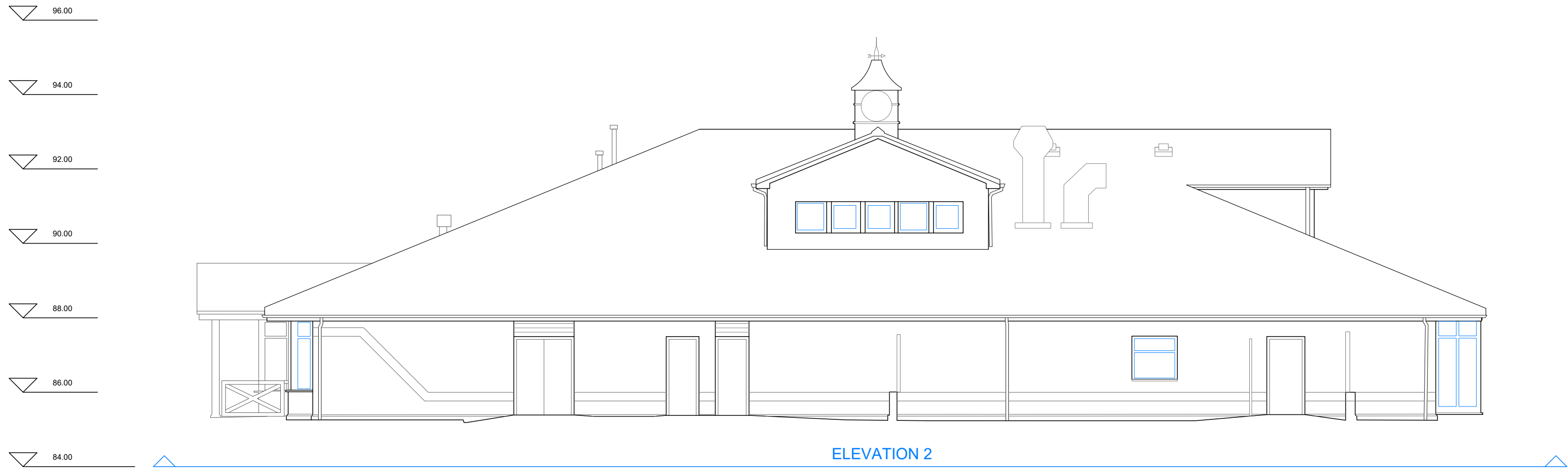
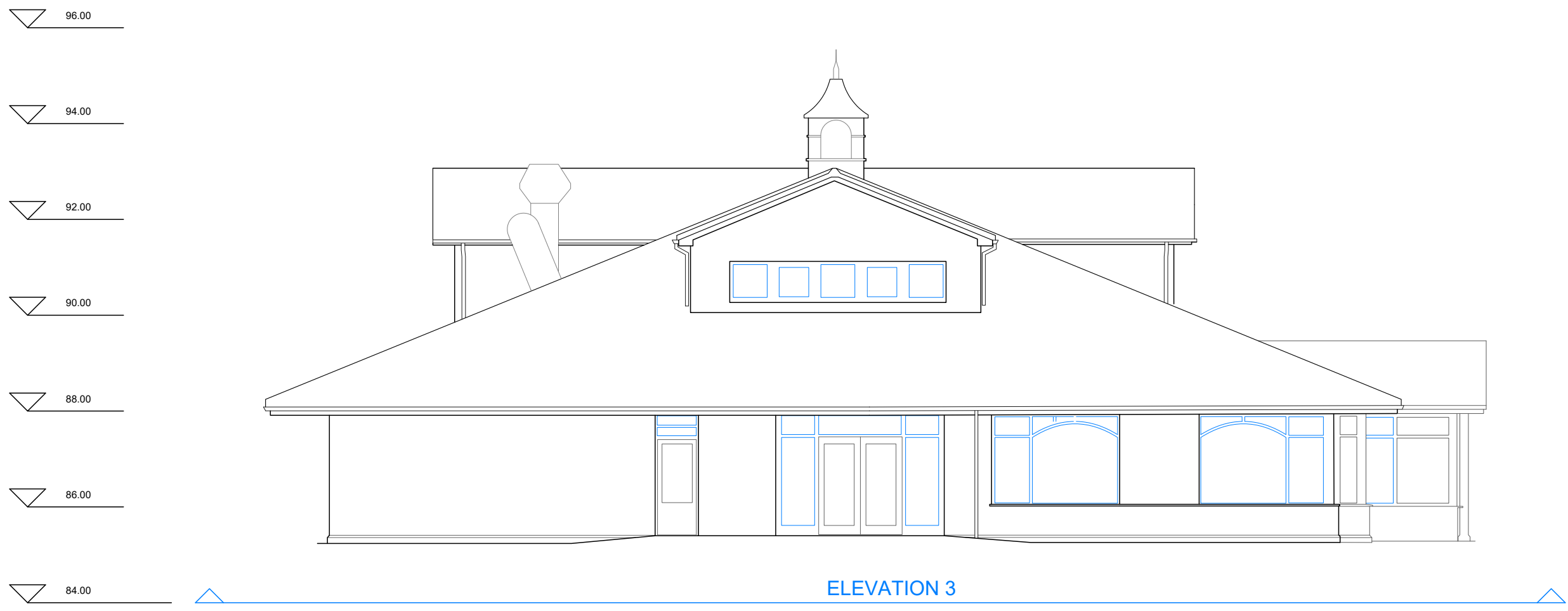
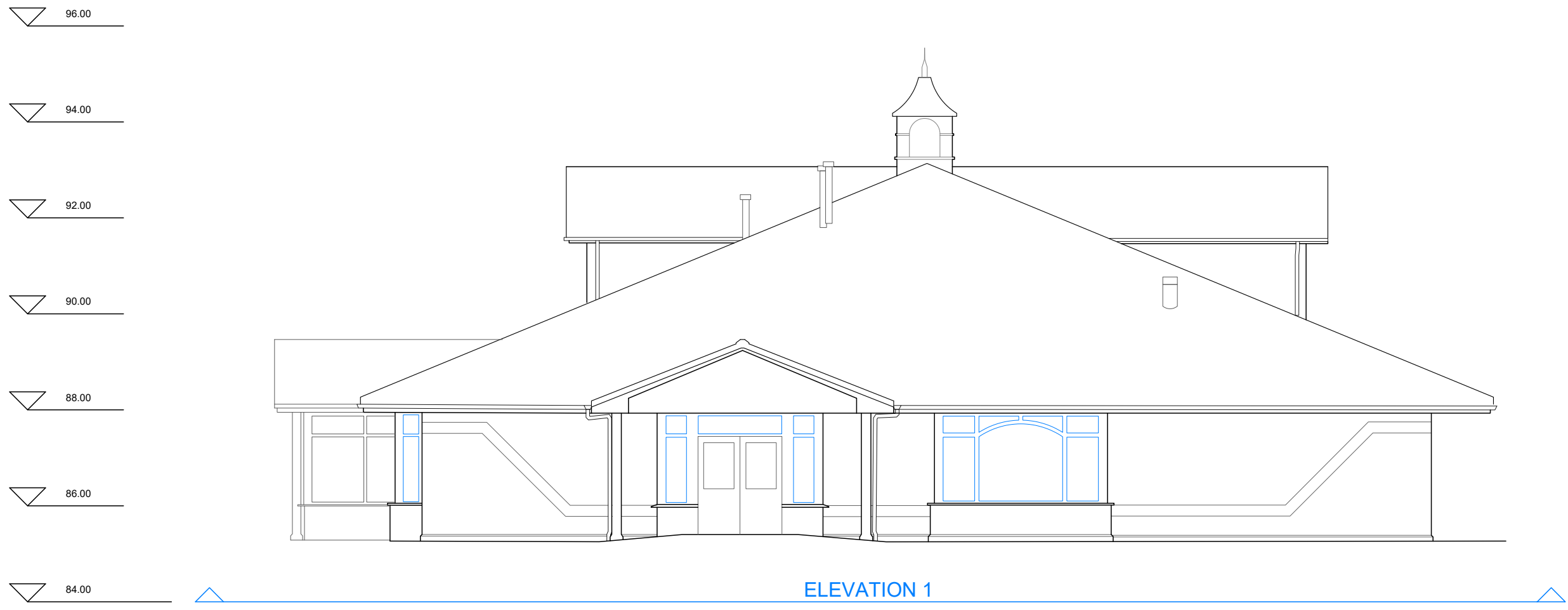
EXISTING TOPOGRAPHICAL SURVEY -YORKSHIRE WATER RECORD MAP



SURVEY STATIONS			
Name	Easting	Northing	Height
M1	418494.333	426998.056	86.337
M2	418481.511	426750.497	86.313
M3	418444.874	426740.307	86.142
M4	418436.187	426731.128	86.265
M5	418420.130	426689.714	86.896
M1A	418480.733	426734.412	86.472
SC1	418502.817	426685.490	86.391

Annotations and Symbols

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MBS ELEVATIONS - LEGEND	
BUILDING EDGE	
GLAZING	
DOORS	
GROUND LINE	
METAL WORK	
MISCELLANEOUS	
ARCHITECTURAL ELEMENT	
PIPES	
RAINWATER PIPES	
RIDGES	
ROOF	
SERVICES	
STONE	
TIMBER	
VEGETATION	

*Some columns/beams may be obscured by plaster / fire boarding / concrete / casing. Therefore the true structural position may not be shown.

*Some site areas may be inaccessible. See highlighted areas for further details.

ASSUMED

This elements and areas may be shown as assumed, with dashed lines. Where possible.

Sheet Layout

1. This survey may relate to an external Coordinate system. If details such as position and orientation relative to this are required please get in touch.
2. All dimensions and measurements given are Scale Factor 1.

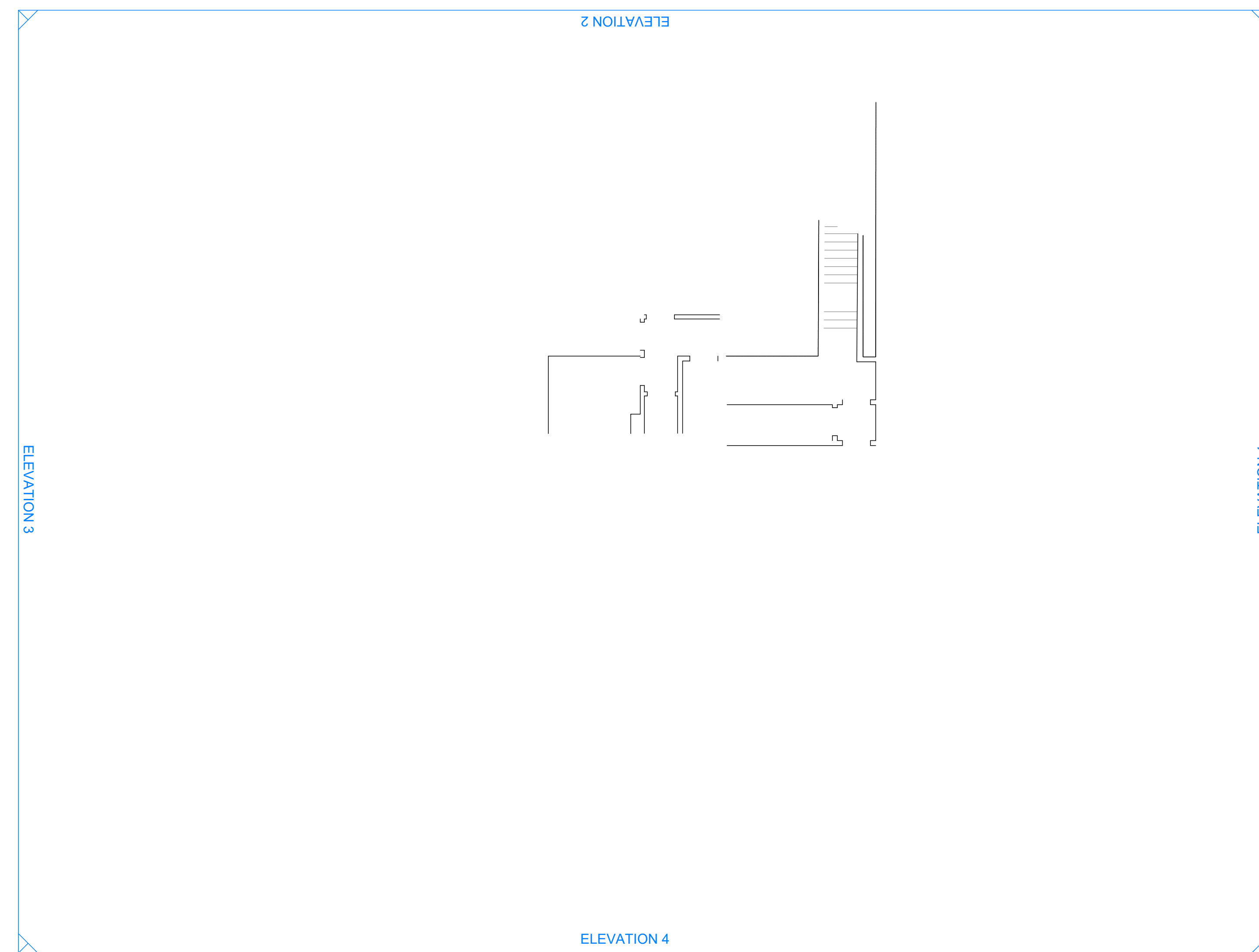
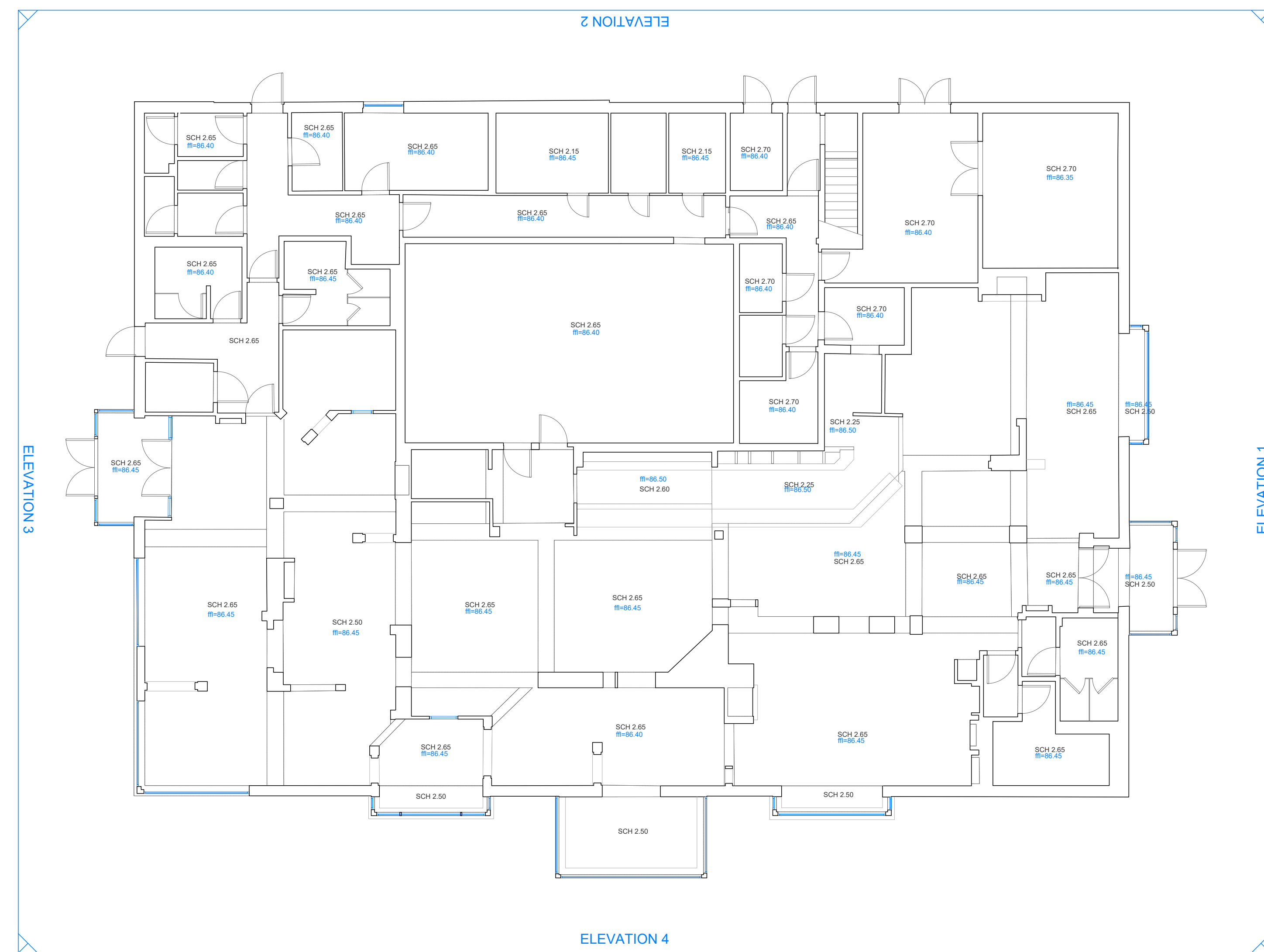
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C				
B				
A	19/08/24	Original Issue	MR	MK
Rev	Rev	Date	Purpose of revision	Drawn / checked



site surveying services

Site Surveying Services Ltd, Unit 1 The Old Saw Mill,
Shawbridge Street, Clitheroe, BB7 1LY
T: 01200 438320 W: www.sitesurvey.co.uk

Client	Allison Pike		
Project	Premier Inn, Bradford South		
Drawing title	Elevations		
Scale	1:200 @ A0	DO NOT SCALE	
SSS - Job No.	S24737		
Client Job No.	N/A		
Drawing number	S24737-DR-M-002	Rev	A
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.			





YORKSHIRE WATER PROTECTION OF MAINS AND SERVICES

1. The position of Yorkshire Water Services Ltd (YWS) apparatus shown on the existing mains record drawing(s) indicates the **general** position and nature of our apparatus and the accuracy of this information cannot be guaranteed. Any damage to YWS apparatus as a result of your works may have serious consequences and you will be held responsible for all costs incurred. Prior to commencing major works, the exact location of apparatus must be determined on site, if necessary by excavating trial holes. The actual position of such apparatus and that of service pipes which have not been indicated must be established on site by contacting the Customer Helpline on 0845 124 24 24 for both water and sewerage.
2. The public sewer and water network is lawfully retained in its existing position and the sewerage and water undertaker is entitled to have it remain so without any disturbance. The provisions of section 159 of the Water Industry Act 1991 provides that the undertaker may "inspect, maintain, adjust, repair or alter" the network. Those rights are given to enable the undertaker to perform its statutory duties. Any development of the land or any other action that unacceptably hindered the exercise of those rights would be unlawful. The provisions contained in Section 185 of the Water Industry Act 1991 state that where it is reasonable to do so, a person may require the water supply undertaker to alter or remove a pipe where it is necessary to enable that person to carry out a proposed change of use of the land. The provisions contained in Section 185 also require the person making the request to pay the full cost of carrying out the necessary works.
3. Ground levels over existing YWS apparatus are to be maintained. Sewers in highways will **generally** be laid to give 1200mm of cover from finished ground level working to kerb races, other permanent identification of the limits of the road or to an agreed line and level. Substantial increases or decreases to this 1200mm depth of cover will result in the sewer being re-laid at your expense. Water mains and services will **generally** be laid with a minimum of 750mm depth of cover however some mains and services usually those installed over 50 years ago may have less ground cover.
4. If surface levels are to be decreased / increased significantly the effects on existing water supply apparatus will be carefully considered and if any alterations are necessary, the costs of the alterations will be recharged to you in full. Outlets on fire hydrants must be no more than 300mm below the new levels and all surface boxes must be adjusted as part of the scheme.
5. To enable future repair works to be carried out without hindrance; any pipe, cable, duct, etc. installed parallel to a water main or service pipe should not be installed directly over or within 300mm of a water main or service pipe or 1000mm of a waste water asset. Where a pipe, cable, duct, etc. crosses a main or service it should preferably cross perpendicular or at an angle of no less than 45° and with a minimum clearance of 150mm. These requirements apply to activities within an existing highway and are relevant to the installation of pipes, cables, ducts, etc. up to and including 250mm in diameter (*see illustration below*). Necessary protection measures for installations greater than 250mm in diameter and/or in private land will need to be agreed on an individual basis. Installations within a new development site must comply with the National Joint Utilities Group publication Volume 2: NJUG Guidelines On The Positioning Of Underground Utilities Apparatus For New Development Sites.
6. All excavation works near to YW apparatus should be by hand digging only.
7. Backfilling with a suitable material to a minimum 300mm above YW apparatus is required.
8. Adequate support must be provided where any works pass under YW apparatus.
9. Jointing chambers, lighting columns and other structures must be installed in such a way that future repair or maintenance works to YW apparatus will not be hindered.
10. Apparatus such as; railings, sign posts, etc. must not be placed in such a way that they prevent access to or full operation of controlling valves, hydrants or similar apparatus. YWS surface boxes must not be covered or buried. Any adjustment, alteration or replacement of manhole covers must be agreed on site prior to the commencement of the works with a YWS Inspector who may be contacted via our Call Centre on 0845 124 24 24.
11. Explosives shall not be used within 100 metres of any Yorkshire Water Services apparatus or installations.
12. Vibrating plant should not be used directly over any apparatus. Movement or operation by vehicles or heavy plant is not to be permitted in the immediate vicinity of YWS plant or apparatus unless there has been prior consultation and, if necessary, adequate protection provided without cost to YWS.
13. **Under no circumstances** should thrust boring or similar trenchless techniques commence until the actual position of the Company's mains/services along the proposed route have been confirmed by trial holes.
14. Any alterations to the highway should be notified following the procedures outlined in the New Road and Street Works Act 1991 Code of Practice; Measures Necessary Where Apparatus Is Affected By Major Works (Diversionary Works).
15. You will be held responsible for any damage or loss to YWS apparatus during and after completion of work, caused by yourselves, your servant or agent. Any damage caused or observed to YWS plant or apparatus should be immediately reported to YWS. Should YW incur any costs as a result of non-compliance with the above, all costs will be rechargeable in full.
16. You should ensure that nothing is done on the site to prejudice the safety or operation of YWS employees, plant or apparatus.
17. In accordance with the New Roads and Street Works Act 1991, Chapter 22, Part 3, Section 80. The location of any identified YW asset "which is not marked, or is wrongly marked, on the records made available" should be communicated back to Yorkshire Water. The location of the apparatus should be identified on copies of the supplied plans which should be returned to Yorkshire Water (Asset Records Team) with photographic supporting evidence where possible.
18. The Government has decided that responsibility for private sewers serving two or more properties and lateral drains (the section of pipe beyond the boundary of a single property, connecting it to the public sewer) will be transferred to the water companies on Oct 1 2011.

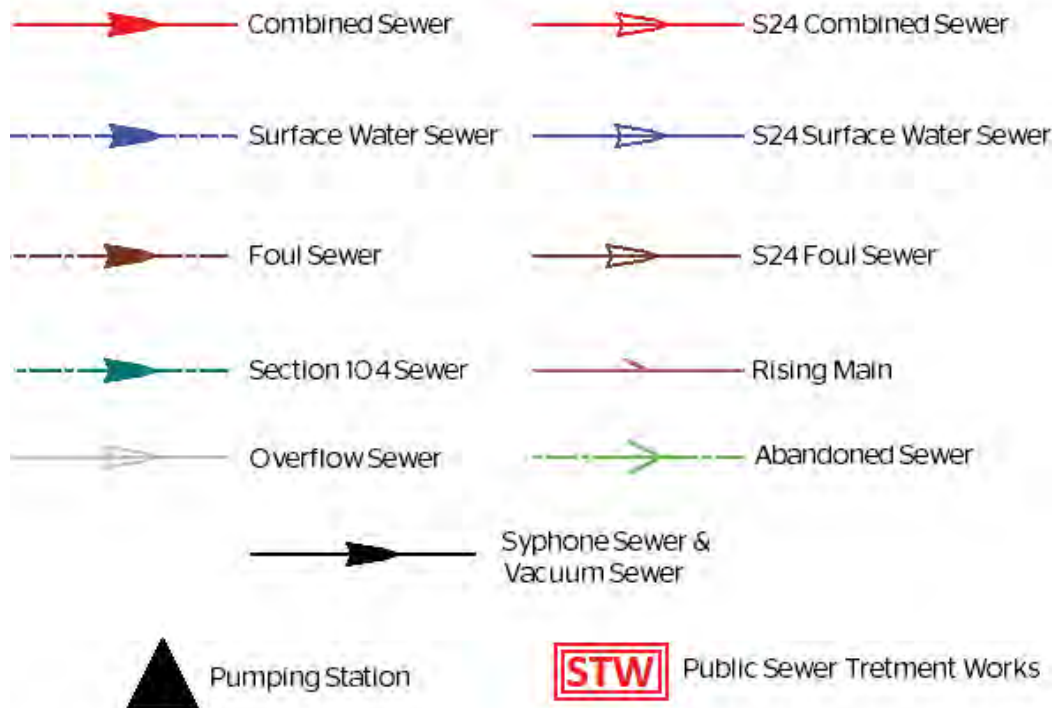
Private pumping stations will also transfer during the period 1 October 2011 – 1 Oct 2016. Records of these assets may not yet be shown on the existing mains record drawing(s). If you encounter any of these assets you must inform Yorkshire Water Services Ltd (YWS).

19. Please note that the information supplied on the enclosed plans is reproduced from Ordnance Survey material with the permission of the Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office, © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Licence Number 1000019559.
20. This information is for guidance only and the position and depth of any YW apparatus is approximate only. Likewise, the nature and condition of any YW apparatus cannot be guaranteed. YW has no responsibility for recording the locations of privately owned apparatus. As of 1 October 2011, there may be some lateral drains and/or public sewers which are not documented on YW records but may still be present. For the avoidance of doubt, this information is not a substitute for appropriate professional and/or legal advice. YW accepts no responsibility for any inaccuracy or omissions in this information. The actual position of YW apparatus must be determined on site by excavating trial holes by hand. YW requires a minimum of two working days' written notice of the intention to excavate any trial holes before any excavation can be undertaken. If there are any queries in this respect please contact Yorkshire Water on 0845 124 24 24.

Property Identifier

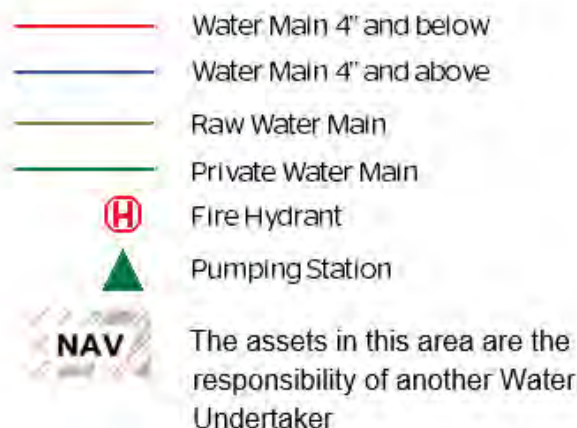


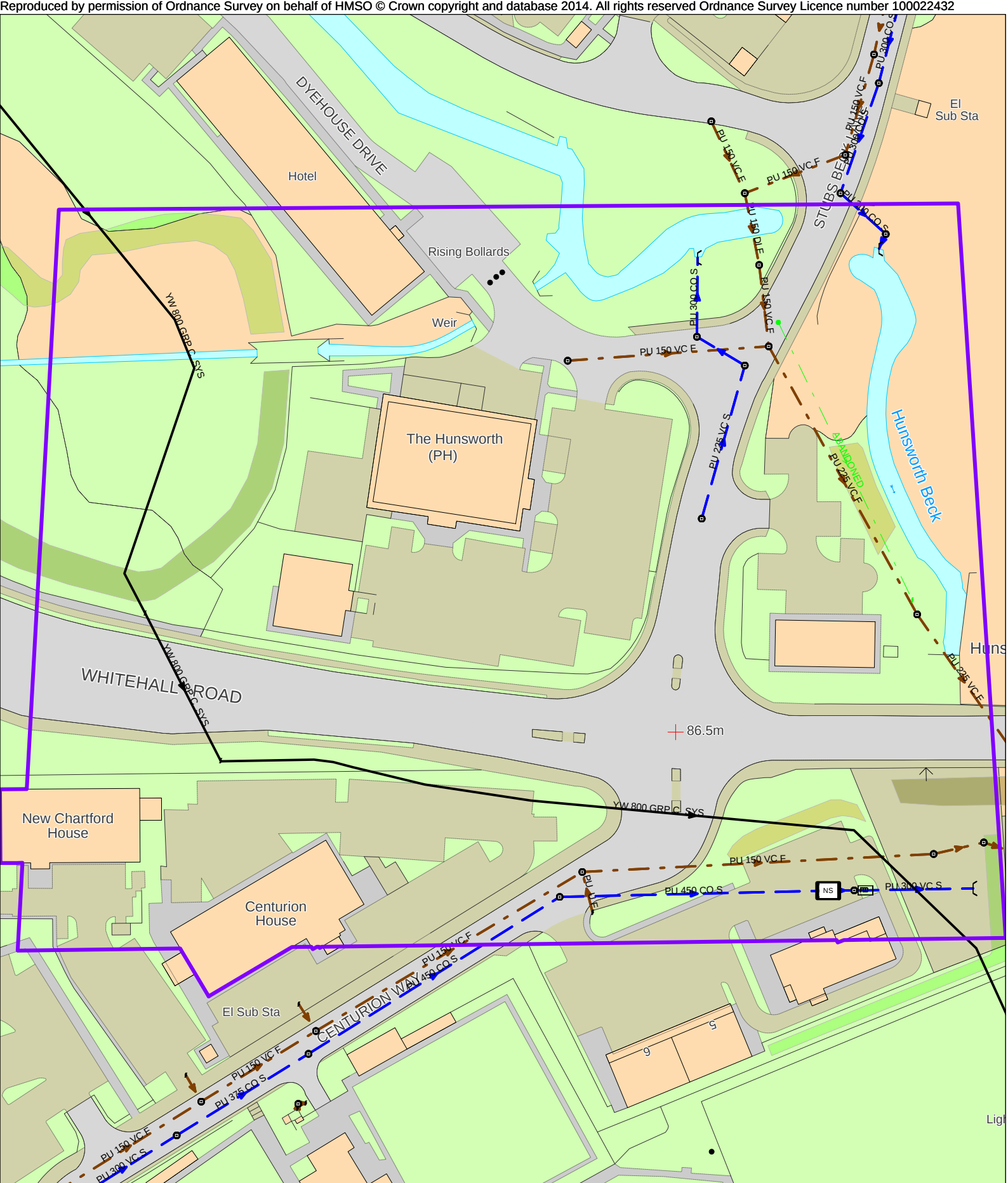
Sewer Legend



Please note that the direction of flow arrows may not always appear depending on the scale of the map.

Water Legend





Public Waste Water Network 23/07/2024 12:03:50 OS Grid Coordinates: 418361 : 426579 Map Name : SE1826NW svcGISSafeMovePD

APPENDIX C

EA 'PRODUCT 4' MAPS



Environment
Agency

Planning advice for developers – FAQs

INTRODUCTION

Local planning authorities (LPAs) across Yorkshire are required to consult us on [certain planning applications](#) which affect flood risk, groundwater, waste, or water quality.

If your development falls into one of these categories, we'll be invited to comment on your planning application. Your LPA, when considering your application, will take our comments into account.

We've produced this guidance to summarise the environmental issues we're responsible for. The guidance forms part of our free advice service; if you require site-specific or face-to-face advice, we'll need to recover our costs through our [charged advice service](#). Engaging with us early can help you identify the big issues, reduce the chances of subsequent delays and help you design a more sustainable and attractive development.

DEVELOPMENT AND FLOOD RISK

Is my development proposal at risk of flooding?

The [flood map for planning](#) shows where flooding from rivers and the sea may occur. Whilst this map isn't suitable for a detailed flood risk assessment, it'll show which [flood zone](#) your development is located within and therefore will indicate whether further assessment is needed. You should also refer to your LPA's [strategic flood risk assessment](#) which will provide additional local information on flood risk, including the location of functional floodplain and areas which are susceptible to other sources of flooding such as from surface water or reservoirs.

Will my application need to pass the sequential and exception tests?

Local planning authorities apply the [sequential test](#) to steer development towards areas at the lowest risk of flooding. If your proposal is located within flood zones 2 or 3, you should contact your LPA to discuss the sequential test **before** submitting your application. The LPA may require you to submit information with your application in support of the sequential test.

If the LPA confirm that the sequential test has ruled out steering the development to lower risk sites, the development may also need to pass the [exception test](#) by demonstrating that its sustainability benefits outweigh flood risk and that it can be made safe for its lifetime, through the production of a site-specific flood risk assessment. [Planning practice guidance](#) advises when an exception test will be required, which will depend on the [vulnerability of the development](#) and the flood zone it lies within.

Do I need to submit a flood risk assessment with my planning application?

You'll need to submit a flood risk assessment if your application lies within flood zones 2 or 3 or is over 1 hectare within flood zone 1. You'll also need to submit an assessment if your proposal could be affected by sources of flooding other than from rivers or the sea. For certain lower risk applications, we've provided '[flood risk standing advice](#)' which enables local planning authorities to assess flood risk assessments without the need to consult us.

What information should I include in my flood risk assessment?

We recommend that you refer to the checklist for a [site-specific flood risk assessment](#) for detailed advice on what to include in your flood risk assessment. Alongside referring to your LPA's strategic flood risk assessment, you should contact your LPA to find out whether there are any development guidelines which are specific to your locality.

Can I undertake my own flood risk assessment?

Your FRA must be appropriate to the scale, nature and location of the development whilst being credible and fit-for-purpose. Whilst it's possible to undertake your own assessment, most applicants employ suitably experienced professionals. We're not able to recommend specific consultants, but a simple web search should help you source a competent individual or company.

Do I need to consider how climate change will affect my proposal's flood risk?

Yes, you should demonstrate how flood risk will be managed now and over the development's lifetime, taking climate change into account. Please refer to the following [guidance](#) when undertaking your flood risk assessment. In some cases we'll hold the climate change flood data you need. In others you'll need to undertake your own analysis to understand the impacts.

Where can I get modelled or historic flood levels from?

Email our Customers and Engagement team (neyorkshire@environment-agency.gov.uk) to find out whether we have any modelled or historic flood levels available for your development site. A list of the packages of information we're able to provide can be found under the 'get information to complete an assessment' section of the [planning practice guidance](#). They'll aim to provide this information within 20 days. We no longer charge for providing this information.

The risk portrayed by your flood map doesn't seem to reflect the site's actual risk. How do I 'challenge' your flood map?

If you have evidence suggesting that our flood map is inaccurate, please contact our Customers and Engagement team (neyorkshire@environment-agency.gov.uk) who will provide you with any existing data we hold. To formally contest our flood zones, you'll need to submit supporting evidence, such as digital copies of a topographic survey or modelling for quality assurance purposes. Digital files of the proposed new flood zones in ArcMap or MapInfo format should also be supplied. Any new outline data you submit must conform to our flood zones policy, copies of which are available on request.

Whilst we'll usually be happy to review any topographical survey or model prior to the application being submitted, we would have to recover our costs for this work. In some cases where work to review and update our existing models is already underway, we may decline to consider a challenge.

As we have to be certain that the data which informs our flood map is fit-for-purpose, any revisions will need to meet stringent quality checks.

SURFACE WATER AND DRAINAGE

Who's responsible for managing surface water?

[Lead local flood authorities](#) are responsible for providing advice on the management of surface water resulting from new [major](#) development. [Internal drainage boards](#), where established, have permissive powers to manage water levels within their drainage districts, so also play a key role in managing surface water.

Will I need to provide surface water storage and limit the discharge rate?

You should contact your lead local flood authority to discuss surface water discharge rates and storage requirements. Typically, they'll ask that your development does not increase run-off and limits the discharge to the existing greenfield run-off rate (usually 1.4l/s/ha if not calculated).

Do I need to install sustainable drainage systems?

[Sustainable Drainage Systems \(SuDS\)](#) should always be carefully considered in discussion with your lead local flood authority. A SuDS scheme can reduce flood risk, improve water quality, create better habitats for wildlife, and produce pleasant, more amenable places for people.

Infiltration drainage must not, however, pose a risk to groundwater quality. All infiltration SuDS must:

Meet the groundwater protection criteria set out on [GOV.UK](https://www.gov.uk)

Not be constructed in ground affected by contamination

Who should I contact about connecting my development to the mains sewer?

Talk to your water company about connecting to their sewerage system. Here are some contact details for water companies operating in the Yorkshire Environment Agency area:

Yorkshire Water	planningconsultation@yorkshirewater.co.uk
Northumbrian Water	developmentenquiries@nwl.co.uk
Severn Trent Water	new.connections@severntrent.co.uk

My development is a long way from the mains sewer. Can I install a ‘non-mains’ drainage system, such as a package treatment plant?

New development should connect to the public mains sewer wherever possible. Individual treatment plants can deteriorate local water quality and are more challenging to monitor and regulate. If you can’t connect to the mains sewer, your planning submission should outline how you will deal with foul drainage discharge. You should include evidence as to why it is not possible to connect to the mains system, including details of any prohibitive costs. Please

note that some 'non-mains' foul water drainage systems will require an environmental permit, irrespective of any planning approval.

OTHER ENVIRONMENTAL CONSIDERATIONS

What other environmental issues will you consider with my planning application?

Your planning application will need to demonstrate that any environmental risks can be managed, through design and construction, for the development’s lifetime. Alongside flood risk, the key environmental risks we’ll consider are:

Land Contamination

We’re mainly interested in those sites where there is a risk of pollution to controlled waters. You should investigate any contamination to see whether the environmental risk or cost of clean-up (remediation) would hinder your proposal. If contamination is known or suspected, a desktop study, investigation, remediation and other works may be required to enable safe development. Our [model procedures for the management of land contamination](#) provide further information.

Pollution prevention

Your application should demonstrate how you’ll minimise the risk of pollution from all aspects of your development, including construction and

operation phases. Groundwater can be vulnerable to pollution, as well as rivers and streams. Some areas (source protection zones and aquifers) are especially sensitive to pollutants as they typically supply public drinking water. To find out whether your development is located in an area sensitive to groundwater pollution, visit our interactive [maps](#). Advice on groundwater protection can be found on [GOV.UK](#)

Fisheries, biodiversity, geomorphology and protected species

If your proposal is likely to affect the ecology of a main river, you'll need to carry out a risk assessment. This assessment should show that your development can proceed without demonstrable harm, and should propose mitigation, compensation or enhancements where required. A survey should be carried out if any protected species are thought to be nearby. If this survey confirms the presence of protected species or their habitat, measures should be taken to manage the development's risks. Natural England are the statutory consultee for other biodiversity-related matters. Further information on their remit can be found on [GOV.UK](#)

Water framework directive

If your proposal affects ground or surface waterbodies, you'll need to consider the [Water Framework Directive](#) (WFD) and the actions set out in the [Humber River Basin Management Plan](#). You'll also need to submit a [WFD Assessment](#) demonstrating how the development will prevent deterioration and improve the waterbody's ecological status.

River buffer zone

Your development should ensure that an 8m strip of land (planted with locally appropriate, native species) is left undisturbed next to the bank of any main river. This 'river corridor' will improve habitat connectivity and will ensure we're able to access the bank for any future flood defence construction and maintenance.

Culverting

We're opposed to culverting. Culverts degrade watercourses' ecology and prevent the movement of wildlife and fish. As culverts can easily become blocked, they increase flood risk. They're also difficult to inspect and maintain. We may object to any planning applications involving culverting on a main river and may refuse to grant an environmental permit. Existing culverts should be removed and the river channel and bankside habitat reinstated to restore the ecological continuity of the river channel and its corridor.

Will I need any other Environment Agency permits for my development?

You might need an environmental permit if your development manages or produces waste or emissions that pollute the air, water or land or is work that affects a [main river](#) or a sea defence. The lead local flood authority is responsible for any consents relating to ordinary watercourses.

The [Environmental Permitting Regulations \(England and Wales\) 2015](#) cover water discharges, groundwater activities, flood risk activities, radioactive substances, waste, mining waste and installations. They also include provision for a number of directives including batteries. Further information, including contact details for further permitting related enquiries, can be found [here](#).

As planning and permitting decisions are often closely linked, we have issued detailed [guidance for developments requiring planning permission and environmental permits](#). This guidance explains how, when responding to planning consultations that require environmental permits, we will advise of three possible positions:

No major permitting concerns

More detailed consideration is required and parallel tracking is recommended

Don't proceed – unlikely to grant a permit.

PRE-APPLICATION ADVICE

Can you provide site-specific advice, review a submission document, or attend a site meeting before I submit my planning application?

We encourage you to seek pre-application advice as it can help you solve key environmental issues early, reduce the chance of an objection and help you design a more sustainable development. If you'd like to take advantage of this service, please email our Sustainable Places team so that we can provide further details and estimated costs.

Please note that any pre-application guidance we provide doesn't represent our final view in relation to any future planning application. We recommend that you seek your own expert advice prior to submitting your application.

Who should I contact for further information?

Yorkshire planning enquiries: sp-yorkshire@environment-agency.gov.uk

General enquiries: 03708 506 506

Environment Agency, Lateral, 8 City Walk, Leeds LS11 9AT

<https://www.gov.uk/government/organisations/environment-agency>

The Flood Map for Planning

The Flood Map for Planning (Rivers and Sea) can be viewed and downloaded as a PDF file on GOV.UK by following this link: <https://flood-map-for-planning.service.gov.uk> or downloaded in GIS format under an open data licence from the following address: <https://environment.data.gov.uk/>

Please type Flood Map for Planning in the search box.

What is the Flood Map for Planning?

The Flood Map for Planning provides information on flooding from rivers and the sea for England and Wales. The Flood Map also has information on flood defences and the areas benefiting from those flood defences.

The Flood Map for Planning shows the following:

1. Flood Zone 3 (dark blue area on the enclosed map): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences
 - For flooding from rivers the map indicates the extent of a flood with a 1% (1 in 100) chance of happening each year;
 - For flooding from the sea the map shows the extent of a flood with a 0.5% (1 in 200) chance of happening each year.
2. Flood Zone 2 (light blue area): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences. Flood Zone 2:
 - indicates the extent of a flood with a 0.1% (1 in 1000) chance of happening each year.
 - and/or indicates the greatest recorded historic flood, whichever is greater.
3. Flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, together with some natural or constructed entities which retain, store or channel water and which may protect against smaller floods.

Flood History (if applicable)

See the attached map showing the flood history for this site. The extent of flooding, and/or flood level information is only shown for those watercourses surveyed after the flood. Other flooding may have occurred which is not shown. This is the best information currently available. Please note that for this reason, we are unable to confirm if flooding has occurred at a property scale. The Flood History Map PDF we have provided shows the area of land that has flooded rather than any individual property. Please refer to the attached table detailing the causes of those past floods.

In the attached list, there may be outlines which have a Flood Map or the Historical Flood Map status of “Considered and Rejected”. This could be for various reasons, including but not limited to the outline consisting of flooding from surface water, overland flow or sewage. It could also be a result of the data being of very poor quality, or in some cases, where changes in the area make a historical flood outline no longer representative of the flood risk, e.g. ground raising or flow path changes.

Water causing flooding can come from different places, for example 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 sewers or drainage systems which have been overwhelmed or from groundwater rising from underground aquifers.

Please note that this record doesn't include all of the flooding that may have occurred including and since 2nd March 2022. Given the process of recording, verifying and updating our record from major floods is extensive and may take a considerable amount of time.

Assets (if applicable)

Asset Location Map

Please find attached asset map(s) showing the location of all (Agency and non-Agency maintained) flood defences.

Description of Works

See attached table with description of the defences shown on the above drawing, including condition ratings, upstream and downstream crest levels, where available.

Risk of Flooding – Environment Agency Defences

The risk of flooding in this area is now reduced by the presence of flood defences that we maintain, but there still is a residual risk of flooding if these were to breach or be overtopped by a flood greater than that for which they were designed.

Risk of Flooding – Privately Maintained Defences

You will see that the Environment Agency does not maintain any of those defences. However, we undertake regular risk based visual inspections. We do not hold design levels and have no height information on these defences.

Asset Condition Ratings

The performance of a flood defence asset is recorded as the condition of the asset. Our asset inspectors subjectively assess the conditions of assets (during visual inspection site visits) with reference to a national standard template. Each asset is given a rating between one and five with one being very good condition and five being very poor. A condition rating of 3, or 'fair' is the minimal acceptable standard for a critical asset, such as a defence wall that protects properties. We are striving to improve all assets below 'fair' to an acceptable standard.

Asset inspections are done on average every six months, although some critical assets are assessed on a more regular basis. It is possible that adjacent assets are inspected on different dates, which may result in two assets of a similar state of repair having different condition ratings.

Condition ratings of assets may also be affected by the time of year the surveys are conducted, as vegetation may obscure the asset in the summer months, or accessibility may be an issue during winter months. These factors would not usually affect the recorded condition rating of an asset unless the asset is on a borderline between two ratings.

Asset Standard of Protection

Please note that the provided Design Standard of Protection is an estimate and should not be relied on. Please note that where available the defended flood extents provide more reliable information relating to the protection offered by the defence (i.e. at which return period the water levels are likely to overtop the defence). If available and required, the defended flood extents can be provided on request.

Modelling

Please note that whilst the information provided is our best available data, we do not guarantee that is sufficient for land use planning or other such purposes. It is the applicant's responsibility to assess the suitability of the provided model/data for their purposes.

Climate Change

Updated guidance on how climate change could affect flood risk to new development - '[Flood risk assessments: climate change allowances](#)' was published on gov.uk on 19 February 2016. You should confirm the flood risk vulnerability classification and lifetime of your proposed development in line with NPPF and apply the appropriate climate change allowances.

Bespoke Flood Risk Assessment (FRA) advice:

If the pre-application advice is required with regards the preparation of a site-specific Flood Risk Assessment, this can be requested via the Yorkshire Sustainable Places team (email: sp-yorkshire@environment-agency.gov.uk). Charges may apply for any advice that is provided, this currently stands at £100 per hour per person. The [.gov.uk](#) pages provide a good starting point on what to include within a site-specific Flood Risk Assessment and can be accessed via <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>. A site-specific Flood Risk Assessment will need to consider flood risks from all sources, including those associated with defence failure (e.g. breach) and accounting for the predicted impacts as a result of climate change. Please contact the Sustainable Places team if you require advice on how to include these within a Flood Risk Assessment.

Other

Surface Water Map

Lead Local Flood Authorities (LLFA) are responsible for managing local flood risk from surface water flooding and groundwater flooding. You should check with the LLFA as they may have more up to date information regarding this type of flooding.

The Risk of Flooding from Surface Water Flood Map can be viewed and downloaded as a PDF file on GOV.UK by following this link: <https://flood-warning-information.service.gov.uk/long-term-flood-risk>

Surface Water Drainage

The Lead Local Flood Authority is the statutory consultee for planning matters relating to surface water drainage, therefore it is recommended they should be consulted separately regarding this.

Surface water discharge from new development should ideally 'mimic' the pre-development situation using a sustainable drainage system so that the flow and volume of water in watercourses is not increased.

A permit may be required, under the Environmental Permitting Regulations 2016 from the Environment Agency for any proposed works or structures in, under, over or within eight metres of a 'main river' (e.g., a new outfall). A permit is separate to and in addition to any planning permission granted. Further details and guidance are available on the GOV.UK website: <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits>

Risk of Flooding from Reservoirs Map

Outlines and simplified depth and velocity maps can be viewed on our website:

<https://flood-warning-information.service.gov.uk/long-term-flood-risk/#x=438988&y=406600&scale=2>

Please, zoom into the location of interest, and then click on the inundated location for details. As a result a list of reservoirs will be provided with supporting information and a links to other data, such as estimated depths and speed of flooding, at the bottom of the result page.

A map of showing the outlines can also be provided on request.

Flood Warning

The site may be covered by a Flood Warning. To register to receive this service, you can call Floodline 24 hours a day on 0845 988 1188.

LIDAR Data

Please note that our LiDAR data is now available free of charge (Open Data) from <https://environment.data.gov.uk/survey> (once zoomed to the relevant location the available LiDAR products will be listed below the map).

Two LIDAR products are available:

1. Tiled LIDAR data - The full tiled dataset consists of historic LIDAR data which has been gathered since 1998. For some areas we have carried out repeat surveys and data is available in a range of resolutions.
2. Composite LIDAR data - The composite dataset is derived from a combination of our full tiled dataset which has been merged and re-sampled to give the best possible spatial coverage.

Light Detection and Ranging (LIDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground. This technique results in the production of an accurate, cost-effective terrain model suitable for assessing flood risk and other environmental applications.

The Environment Agency owns two LIDAR systems, which are installed in a survey aircraft along with its other operational remote sensing instruments.

The aircraft is positioned and navigated using Global Positioning System (GPS) corrected to known ground reference points. The aircraft typically flies at a height of about 800 metres above ground level and a scanning mirror allows a swath width of about 600 metres to be surveyed during a flight.

The Rights & Responsibilities of a Riverside Owner

The owner of property adjacent to a watercourse is usually deemed to be the riparian owner and, as such, has both riparian rights and responsibilities regarding the watercourse within their ownership.

For more information on Rights and Responsibilities of a riverside owner, you can visit our website at:

[Your Watercourse: Rights and Roles,](#)

Ordnance Survey Data

Under the terms of our licence agreement with the Ordnance Survey, we are unable to supply the OS data. Under this agreement we can only supply OS data to consultants/contractors carrying out work on our behalf.

Did you know?

You can now request flood risk assessment data (also known as a Product 4) online at <https://flood-map-for-planning.service.gov.uk/>

Flood risk assessment data

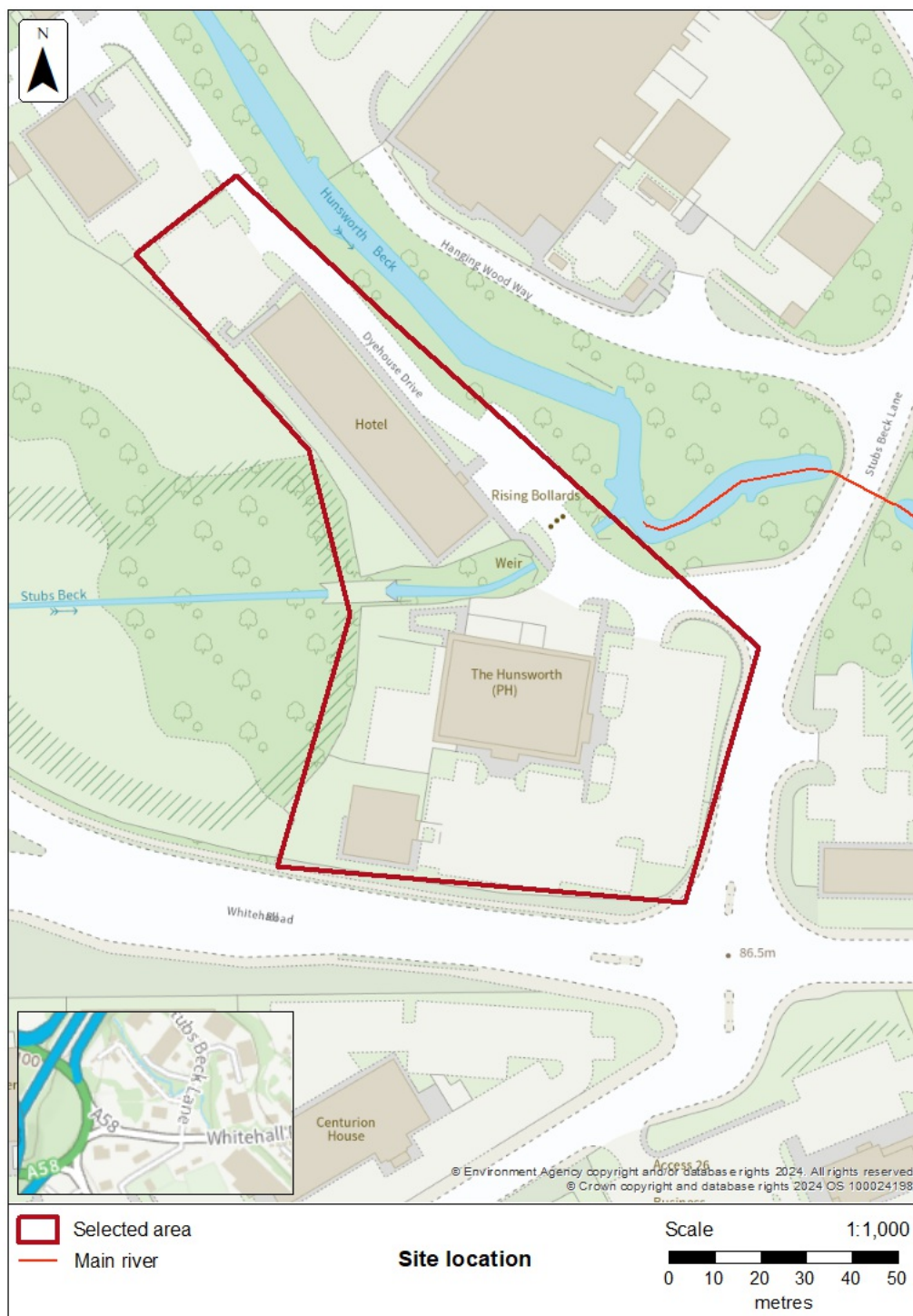
Location of site: 418445 / 426750 (shown as easting and northing coordinates)

Document created on: 19 July 2024

This information was previously known as a product 4.

Customer reference number: BJAAUC7ETHN9

Map showing the location that flood risk assessment data has been requested for.



How to use this information

You can use this information as part of a flood risk assessment for a planning application. To do this, you should include it in the appendix of your flood risk assessment.

We recommend that you work with a flood risk consultant to get your flood risk assessment.

Included in this document

In this document you'll find:

- how to find information about surface water and other sources of flooding
- information on the models used
- definitions for the terminology used throughout
- flood map for planning (rivers and the sea)
- historic flooding
- flood defences and attributes
- information to help you assess if there is a reduced flood risk from rivers and the sea because of defences
- modelled data
- climate change modelled data
- information about strategic flood risk assessments
- information about this data
- information about flood risk activity permits
- help and advice

Surface water and other sources of flooding

Use the [long term flood risk service](#) to find out about the risk of flooding from:

- surface water
- ordinary watercourses
- reservoirs

Or you can contact your Lead Local Flood Authority for further information.

Your Lead Local Flood Authority is Kirklees.

For information about sewer flooding, contact the relevant water company for the area.

About the models used

Model name: 2009 FIM River Spen

Scenario(s): Defended fluvial, defences removed fluvial, defences removed climate change fluvial

Date: 1 March 2009

This model contains the most relevant data for your area of interest.

Terminology used

Annual exceedance probability (AEP)

This refers to the probability of a flood event occurring in any year. The probability is expressed as a percentage. For example, a large flood which is calculated to have a 1% chance of occurring in any one year, is described as 1% AEP.

Metres above ordnance datum (mAOD)

All flood levels are given in metres above ordnance datum which is defined as the mean sea level at Newlyn, Cornwall.

Flood map for planning (rivers and the sea)

Your selected location is in flood zone 3.

Flood zone 3 shows the area at risk of flooding for an undefended flood event with a:

- 0.5% or greater probability of occurring in any year for flooding from the sea
- 1% or greater probability of occurring in any year for fluvial (river) flooding

Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- between a 0.1% and 0.5% probability of occurring in any year for flooding from the sea
- between a 0.1% and 1% probability of occurring in any year for fluvial (river) flooding

It's important to remember that the flood zones on this map:

- refer to the land at risk of flooding and do not refer to individual properties
- refer to the probability of river and sea flooding, ignoring the presence of defences
- do not take into account potential impacts of climate change

The flood zones are not currently being updated. The last update was in November 2023. Some of the flood zones may have changed, however all source data is included in the models below.



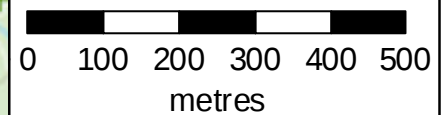
Flood map for planning

Location (easting/northing)
418445/426750

Scale
1:10,000

Created
19 Jul 2024

-  Selected area
-  Main river
-  Flood zone 3
-  Flood zone 2



Historic flooding

This map is an indicative outline of areas that have previously flooded. Remember that:

- our records are incomplete, so the information here is based on the best available data
- it is possible not all properties within this area will have flooded
- other flooding may have occurred that we do not have records for
- flooding can come from a range of different sources - we can only supply flood risk data relating to flooding from rivers or the sea

You can also contact your Lead Local Flood Authority or Internal Drainage Board to see if they have other relevant local flood information. Please note that some areas do not have an Internal Drainage Board.

Your Lead Local Flood Authority is Kirklees.

[Download recorded flood outlines in GIS format](#)



Historic flood map

Location (easting/northing)
418445/426750

Scale
1:10,000

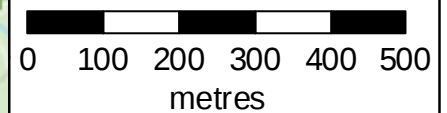
Created
19 Jul 2024

 Selected area

 Main river

Date of flood event

 February, 2020



Historic flood event data

Start date	End date	Source of flood	Cause of flood	Affects location
8 February 2020	19 March 2020	main river	channel capacity exceeded (no raised defences)	No

Flood defences and attributes

The flood defences map shows the location of the flood defences present.

The flood defences data table shows the type of defences, their condition and the standard of protection. It shows the height above sea level of the top of the flood defence (crest level). The height is in mAOD which is the metres above the mean sea level at Newlyn, Cornwall.

It's important to remember that flood defence data may not be updated on a regular basis. The information here is based on the best available data.

Use this information:

- to help you assess if there is a reduced flood risk for this location because of defences
- with any information in the modelled data section to find out the impact of defences on flood risk



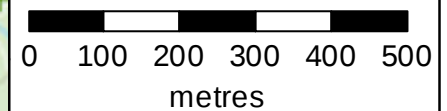
Flood defences

Location (easting/northing)
418445/426750

Scale
1:10,000

Created
19 Jul 2024

-  Selected area
-  Main river
-  Flood defence



Flood defences data

Label	Asset ID	Asset Type	Standard of protection (years)	Current condition	Downstream actual crest level (mAOD)	Upstream actual crest level (mAOD)	Effective crest level (mAOD)
1	174624	Bridge Abutment					
2	99041	Bridge Abutment					
3	174621	Bridge Abutment					
4	99039	Bridge Abutment					

Any blank cells show where a particular value has not been recorded for an asset.

Modelled data

This section provides details of different scenarios we have modelled and includes the following (where available):

- outline maps showing the area at risk from flooding in different modelled scenarios
- modelled node point map(s) showing the points used to get the data to model the scenarios and table(s) providing details of the flood risk for different return periods
- map(s) showing the approximate water levels for the return period with the largest flood extent for a scenario and table(s) of sample points providing details of the flood risk for different return periods

Climate change

The climate change data included in the models may not include the latest [flood risk assessment climate change allowances](#). Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

The Environment Agency will incorporate the new allowances into future modelling studies. For now, it's your responsibility to demonstrate that new developments will be safe in flood risk terms for their lifetime.

Modelled scenarios

The following scenarios are included:

- Defended modelled fluvial: risk of flooding from rivers where there are flood defences
- Defences removed modelled fluvial: risk of flooding from rivers where flood defences have been removed
- Defences removed climate change modelled fluvial: risk of flooding from rivers where flood defences have been removed, including estimated impact of climate change



Defended modelled fluvial extent

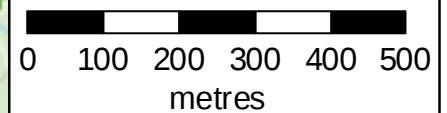
Location (easting/northing)
418445/426750

Scale Created
1:10,000 19 Jul 2024

Model name
2009 FIM River Spen

-  Selected area
-  Main river
- Modelled flood extent
-  1% AEP

Flood extents may not be
visible where they overlap
other return periods





Defences removed modelled fluvial extent

Location (easting/northing)
418445/426750

Scale Created
1:10,000 19 Jul 2024

Model name
2009 FIM River Spen

 Selected area

 Main river

Modelled flood extent

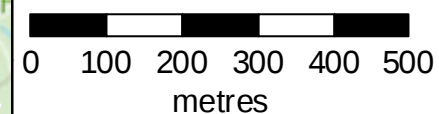
 2% AEP

 1.33% AEP

 1% AEP

 0.1% AEP

Flood extents may not be
visible where they overlap
other return periods





Defences removed climate change modelled fluvial extent

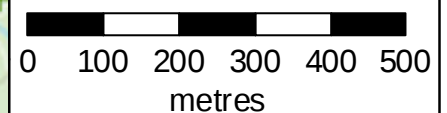
Location (easting/northing)
418445/426750

Scale Created
1:10,000 19 Jul 2024

Model name
2009 FIM River Spen

-  Selected area
-  Main river
- Modelled flood extent
 -  1.0% AEP (+20%)

Flood extents may not be
visible where they overlap
other return periods





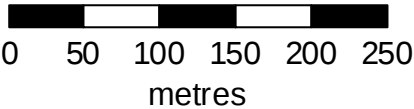
Defended modelled fluvial node locations

Location (easting/northing)
418445/426750

Scale Created
1:5,000 19 Jul 2024

Model name
2009 FIM River Spen

-  Selected area
-  Modelled location
-  Main river



Modelled node locations data

Defended

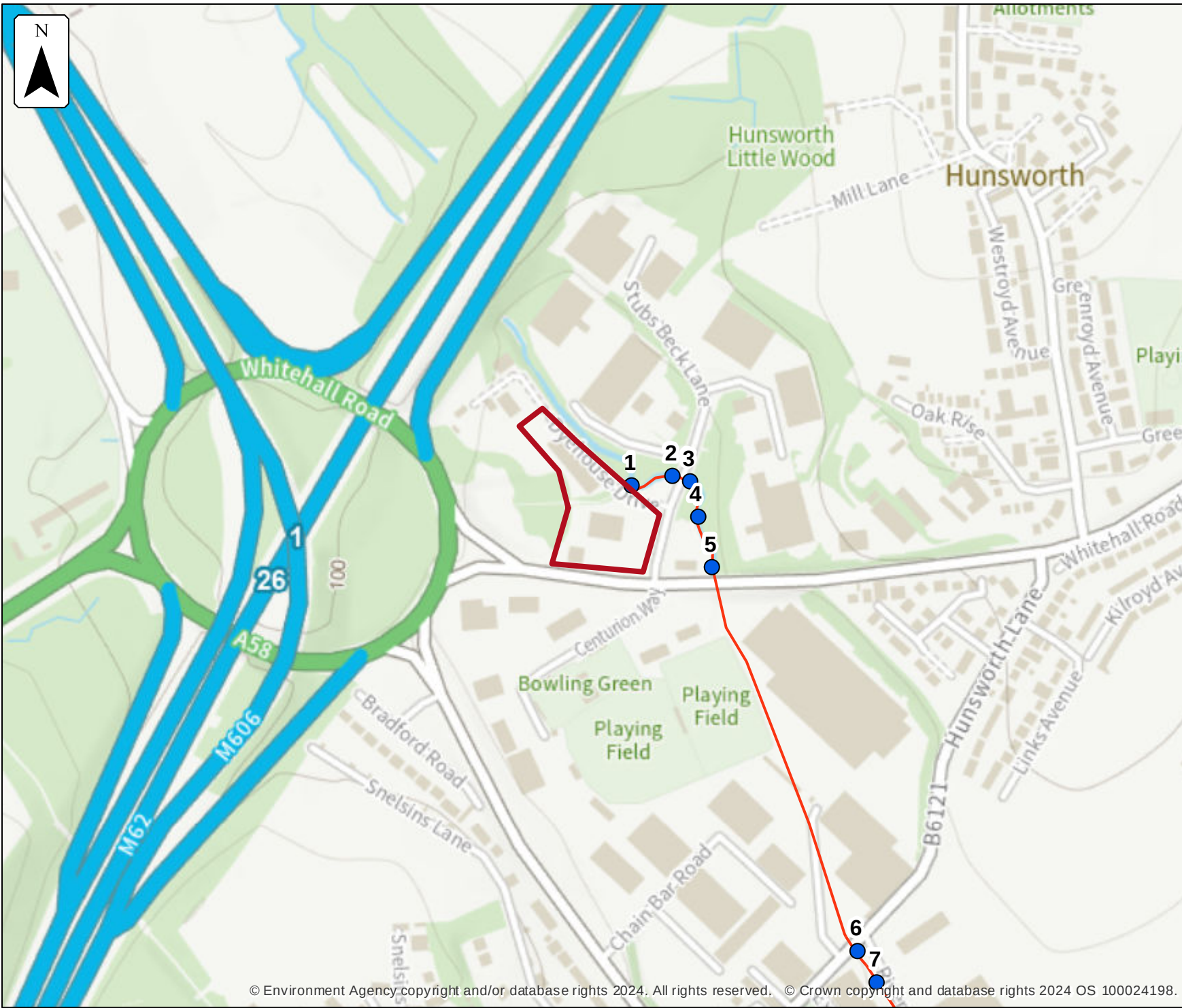
Label	Modelled location ID	Easting	Northing	1% AEP	1% AEP
				Level	Flow
1	261292	418482	426769	85.09	17.41
2	154256	418522	426779	84.66	17.39
3	27451	418539	426773	83.85	17.39
4	202371	418546	426738	83.50	17.38
5	45061	418560	426690	83.36	17.35
6	115207	418701	426317	80.37	17.22
7	249657	418720	426287	80.14	17.21

Data in this table comes from the 2009 FIM River Spen model.

Level values are shown in mAOD, and flow values are shown in cubic metres per second.

Any blank cells show where a particular scenario has not been modelled for this location.

If no level or flow data is available for a scenario, no table will be shown.



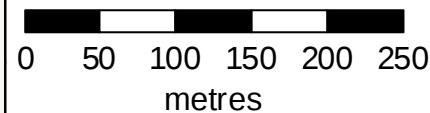
Defences removed modelled fluvial node locations

Location (easting/northing)
418445/426750

Scale Created
1:5,000 19 Jul 2024

Model name
2009 FIM River Spen

-  Selected area
-  Modelled location
-  Main river



Modelled node locations data

Defences removed

Label	Modelled location ID	Easting	Northing	4% AEP	2% AEP	1.33% AEP	1% AEP	0.1% AEP
				Level	Level	Level	Level	Level
1	261292	418482	426769	84.85	84.97	85.04	85.09	86.91
2	154256	418522	426779	84.44	84.55	84.61	84.66	86.94
3	27451	418539	426773	83.69	83.77	83.81	83.85	86.74
4	202371	418546	426738	83.23	83.36	83.44	83.50	86.74
5	45061	418560	426690	83.06	83.20	83.29	83.36	86.73
6	115207	418701	426317	80.06	80.22	80.31	80.37	81.35
7	249657	418720	426287	79.86	80.0	80.09	80.14	80.97

Data in this table comes from the 2009 FIM River Spen model.

Level values are shown in mAOD, and flow values are shown in cubic metres per second.

Any blank cells show where a particular scenario has not been modelled for this location.

If no level or flow data is available for a scenario, no table will be shown.

Defences removed

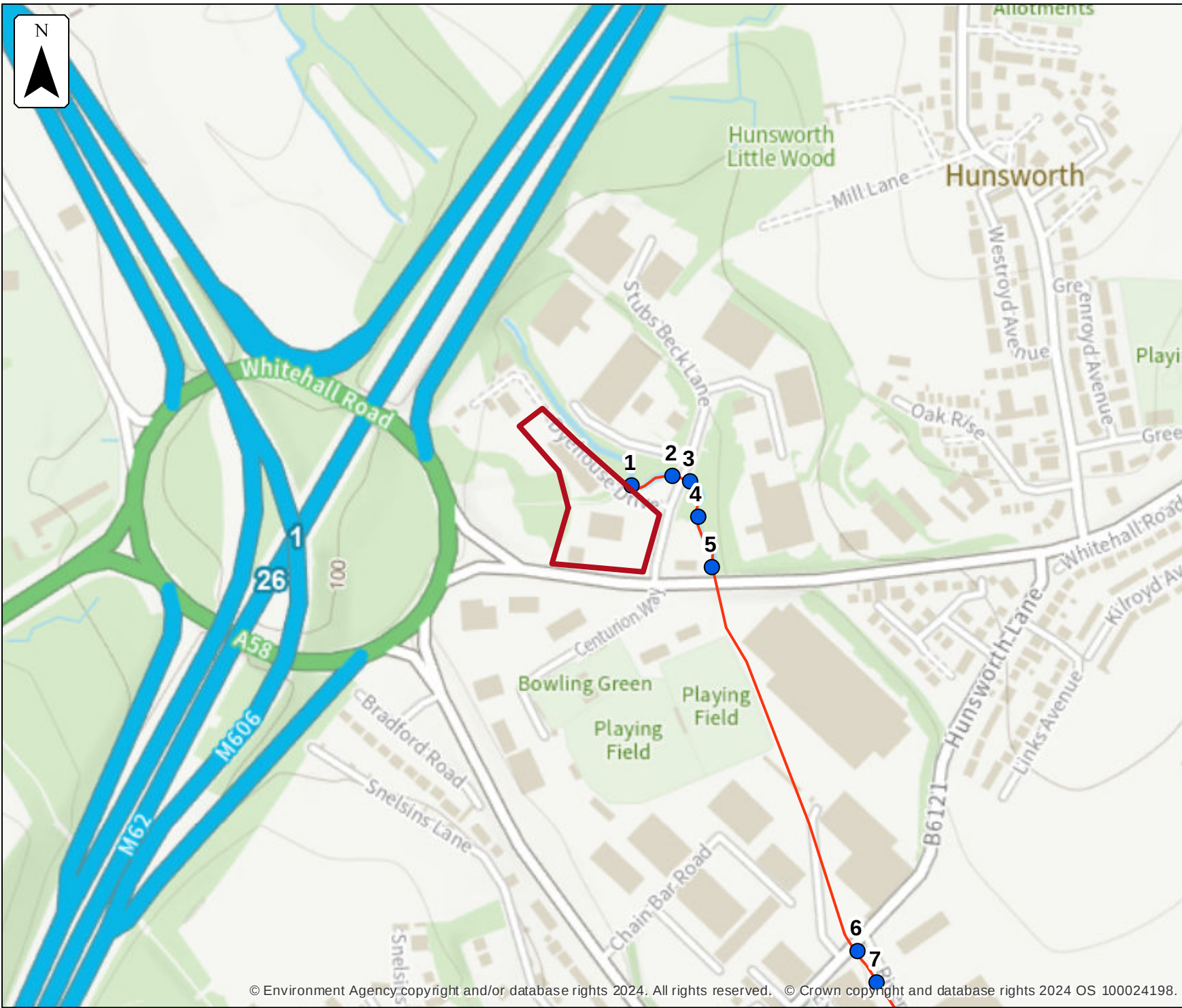
Label	Modelled location ID	Easting	Northing	4% AEP	2% AEP	1.33% AEP	1% AEP	0.1% AEP
				Flow	Flow	Flow	Flow	Flow
1	261292	418482	426769	14.24	15.80	16.73	17.41	38.38
2	154256	418522	426779	14.23	15.79	16.72	17.39	25.21
3	27451	418539	426773	14.23	15.79	16.71	17.39	25.09
4	202371	418546	426738	14.23	15.78	16.71	17.38	23.82
5	45061	418560	426690	14.22	15.77	16.68	17.35	23.63
6	115207	418701	426317	14.18	15.70	16.61	17.22	24.50
7	249657	418720	426287	14.17	15.71	16.62	17.21	27.79

Data in this table comes from the 2009 FIM River Spen model.

Level values are shown in mAOD, and flow values are shown in cubic metres per second.

Any blank cells show where a particular scenario has not been modelled for this location.

If no level or flow data is available for a scenario, no table will be shown.



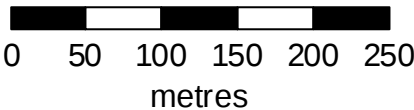
**Defences removed
climate change
modelled fluvial
node locations**

Location (easting/northing)
418445/426750

Scale Created
1:5,000 19 Jul 2024

Model name
2009 FIM River Spen

- Selected area
- Modelled location
- Main river



Modelled node locations data

Defences removed climate change

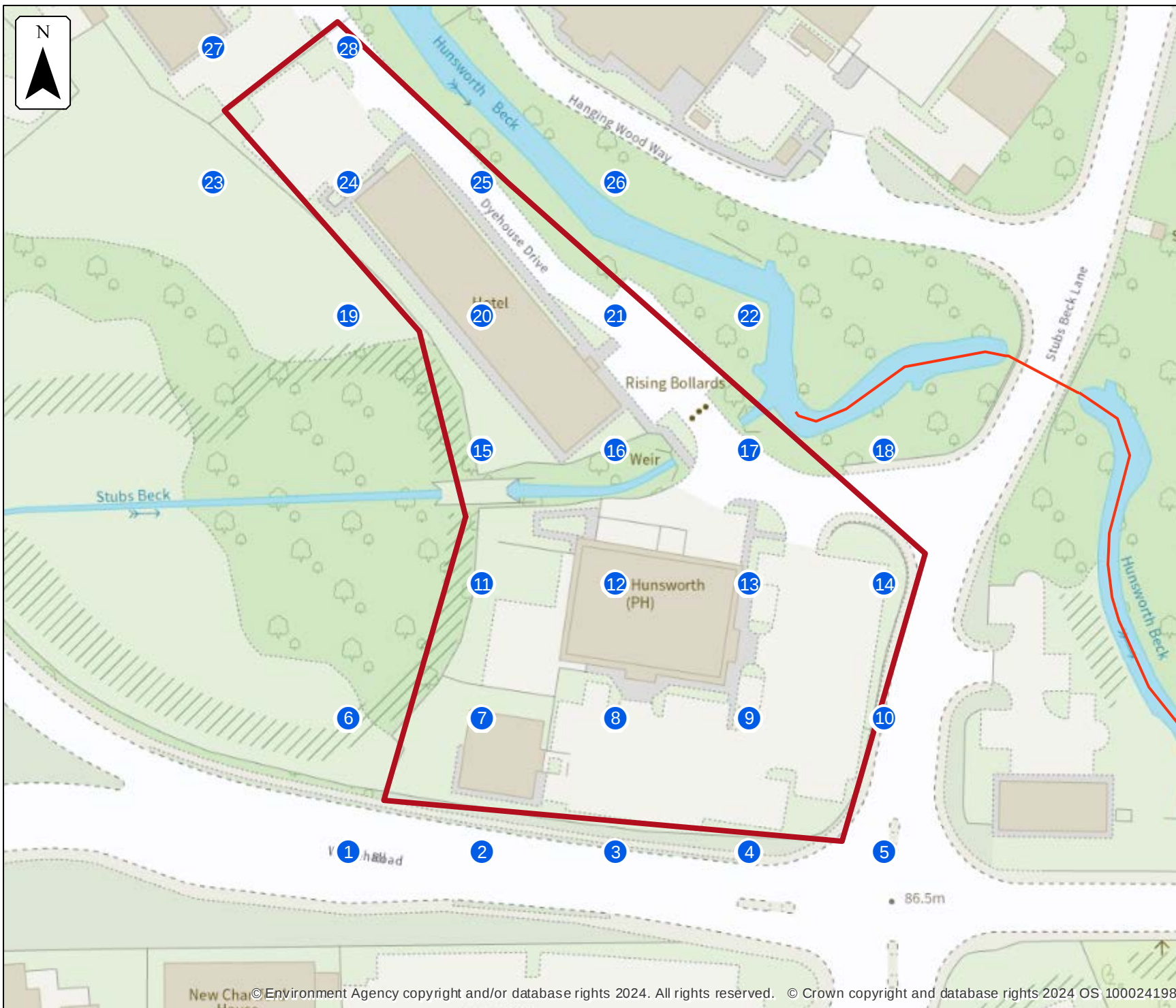
Label	Modelled location ID	Easting	Northing	1.0% AEP (+20%)	1.0% AEP (+20%)
				Level	Flow
1	261292	418482	426769	85.47	20.89
2	154256	418522	426779	85.15	20.74
3	27451	418539	426773	84.88	20.70
4	202371	418546	426738	84.91	20.49
5	45061	418560	426690	84.88	20.30
6	115207	418701	426317	80.63	20.30
7	249657	418720	426287	80.37	20.30

Data in this table comes from the 2009 FIM River Spen model.

Level values are shown in mAOD, and flow values are shown in cubic metres per second.

Any blank cells show where a particular scenario has not been modelled for this location.

If no level or flow data is available for a scenario, no table will be shown.



Defended modelled fluvial extent and depth

Location (easting/northing)
418445/426750

Scale Created
1:1,000 19 Jul 2024

Model name
2009 FIM River Spen

Selected area

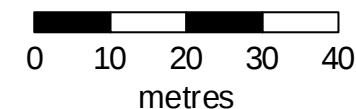
Main river

Modelled 2D grid

Water level in mAOD

- 0 - 31
- 31 - 31.5
- 31.5 - 32
- 32 - 32.5
- 32.5 - 33
- 33 - 33.5
- 33.5 - 34
- 34 - 34.5
- 34.5 - 35

This map shows the
1.0% AEP depth data



Sample point data

Defended

Label	Easting	Northing	1% AEP
			Depth
1	418397	426684	NoData
2	418423	426684	NoData
3	418449	426684	NoData
4	418475	426684	NoData
5	418501	426684	NoData
6	418397	426710	NoData
7	418423	426710	NoData
8	418449	426710	NoData
9	418475	426710	NoData
10	418501	426710	NoData
11	418423	426736	NoData
12	418449	426736	NoData
13	418475	426736	NoData
14	418501	426736	NoData
15	418423	426762	NoData
16	418449	426762	NoData

Label	Easting	Northing	1% AEP
			Depth
17	418475	426762	NoData
18	418501	426762	NoData
19	418397	426788	NoData
20	418423	426788	NoData
21	418449	426788	NoData
22	418475	426788	NoData
23	418371	426814	NoData
24	418397	426814	NoData
25	418423	426814	NoData
26	418449	426814	NoData
27	418371	426840	NoData
28	418397	426840	NoData
Max value in selected area:			NoData

Data in this table comes from the 2009 FIM River Spen model.

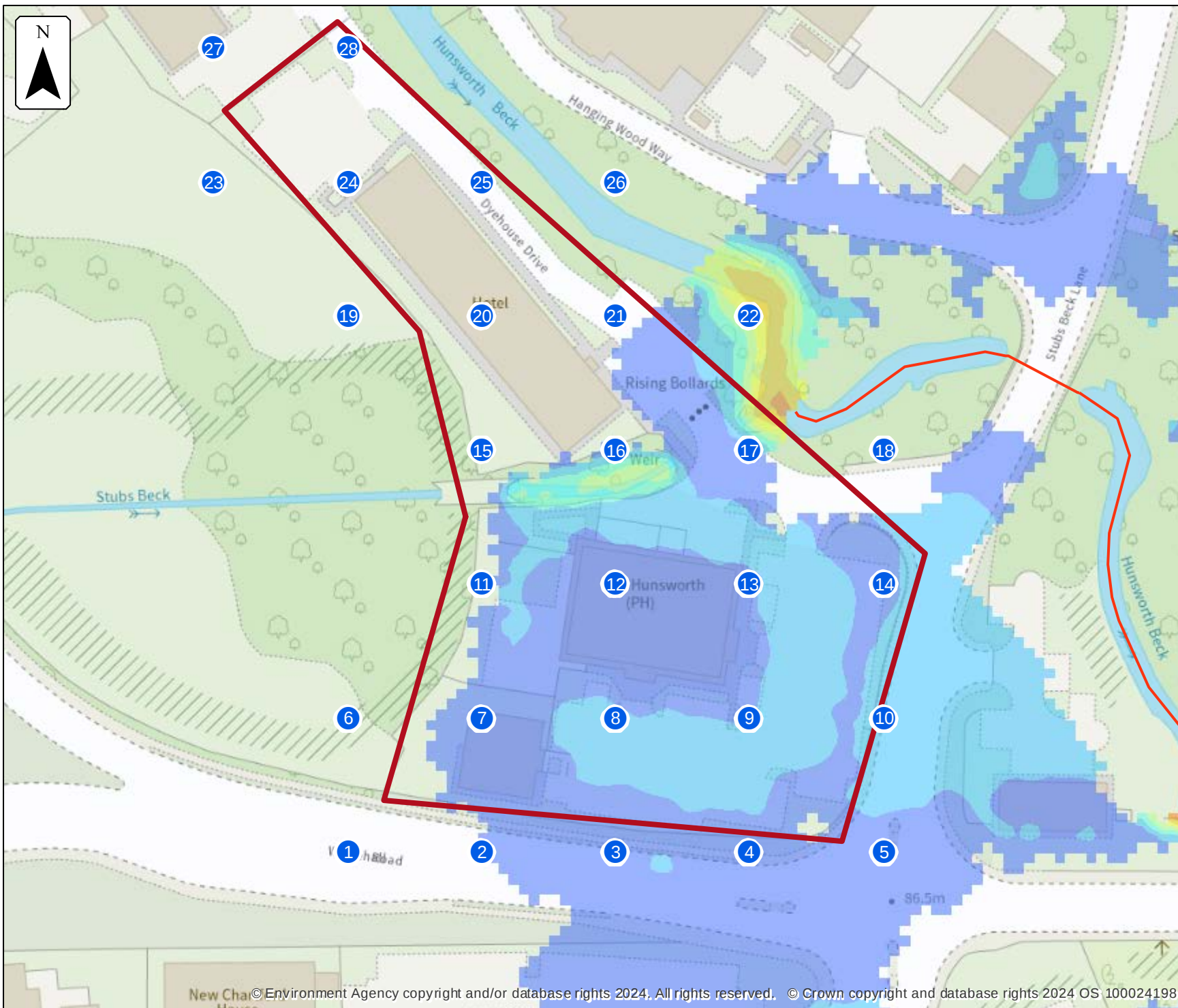
Height values are shown in mAOD, and depth values are shown in metres.

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.



Defences removed modelled fluvial extent and depth

Location (easting/northing)
418445/426750

Scale Created
1:1,000 19 Jul 2024

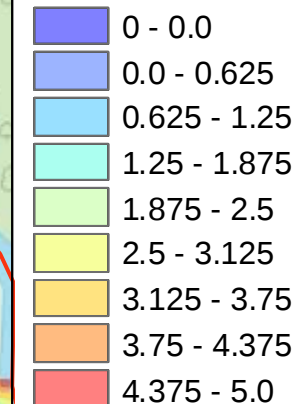
Model name
2009 FIM River Spen

Selected area

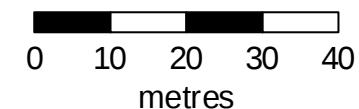
Main river

Modelled 2D grid

Water level in mAOD



This map shows the
0.1% AEP depth data



Sample point data

Defences removed

Label	Easting	Northing	2% AEP	1.33% AEP	1% AEP	0.1% AEP
			Depth	Depth	Depth	Depth
1	418397	426684	NoData	NoData	NoData	NoData
2	418423	426684	NoData	NoData	NoData	0.03
3	418449	426684	NoData	NoData	NoData	0.51
4	418475	426684	NoData	NoData	NoData	0.41
5	418501	426684	NoData	NoData	NoData	0.45
6	418397	426710	NoData	NoData	NoData	NoData
7	418423	426710	NoData	NoData	NoData	0.49
8	418449	426710	NoData	NoData	NoData	0.66
9	418475	426710	NoData	NoData	NoData	0.60
10	418501	426710	NoData	NoData	NoData	0.90
11	418423	426736	NoData	NoData	NoData	NoData
12	418449	426736	NoData	NoData	NoData	0.39
13	418475	426736	NoData	NoData	NoData	0.60
14	418501	426736	NoData	NoData	NoData	0.31
15	418423	426762	NoData	NoData	NoData	NoData
16	418449	426762	NoData	NoData	NoData	NoData

Label	Easting	Northing	2% AEP	1.33% AEP	1% AEP	0.1% AEP
			Depth	Depth	Depth	Depth
17	418475	426762	NoData	NoData	NoData	0.51
18	418501	426762	NoData	NoData	NoData	NoData
19	418397	426788	NoData	NoData	NoData	NoData
20	418423	426788	NoData	NoData	NoData	NoData
21	418449	426788	NoData	NoData	NoData	NoData
22	418475	426788	NoData	NoData	NoData	2.89
23	418371	426814	NoData	NoData	NoData	NoData
24	418397	426814	NoData	NoData	NoData	NoData
25	418423	426814	NoData	NoData	NoData	NoData
26	418449	426814	NoData	NoData	NoData	NoData
27	418371	426840	NoData	NoData	NoData	NoData
28	418397	426840	NoData	NoData	NoData	NoData
Max value in selected area:			NoData	NoData	NoData	3.42

Data in this table comes from the 2009 FIM River Spen model.

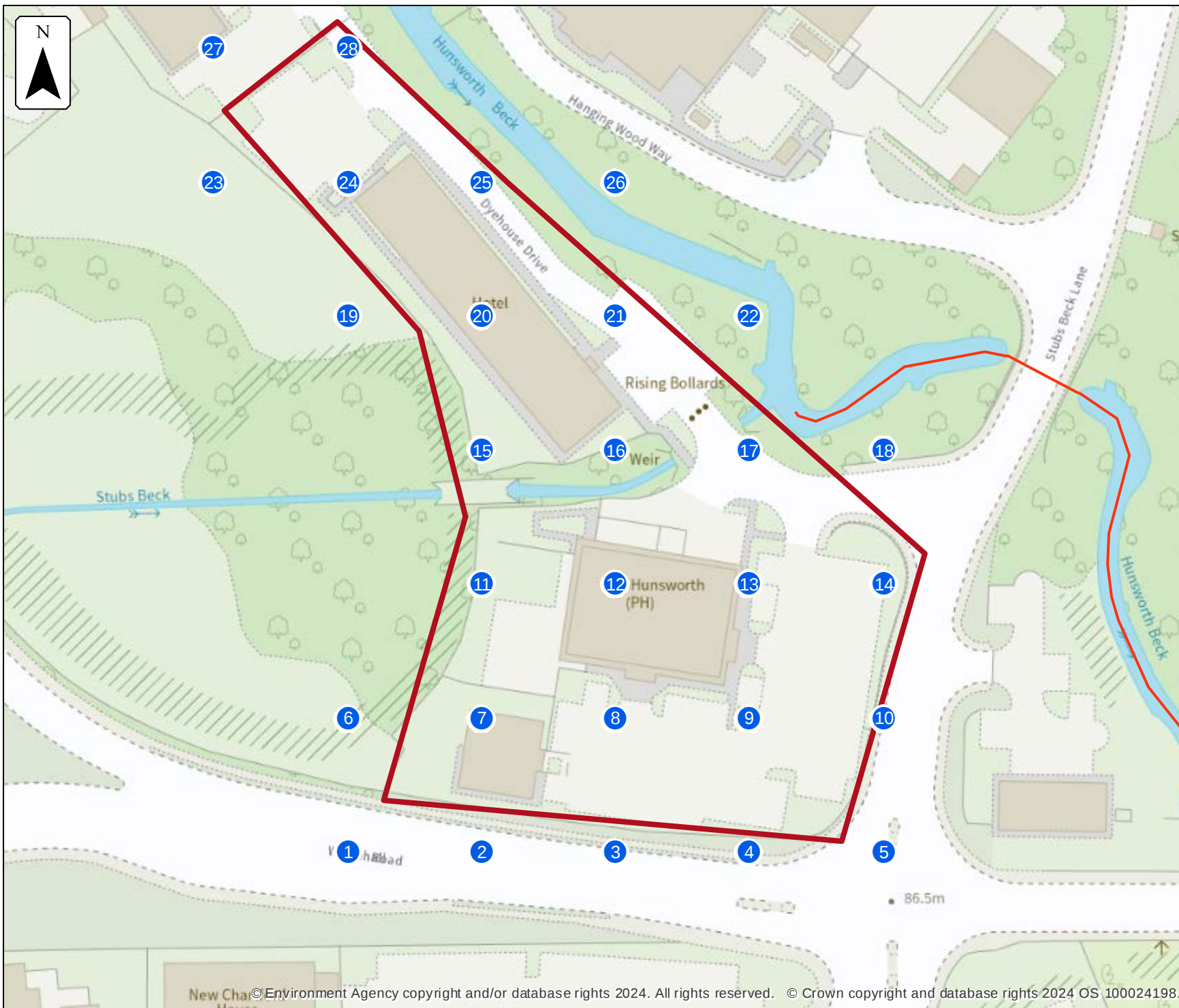
Height values are shown in mAOD, and depth values are shown in metres.

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.



Defences removed climate change modelled fluvial extent and depth

Location (easting/northing)
418445/426750

Scale Created
1:1,000 19 Jul 2024

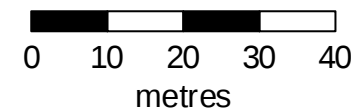
Model name
2009 FIM River Spen

- Selected area
- Main river

Modelled 2D grid
Water level in mAOD

- 0 - 31
- 31 - 31.5
- 31.5 - 32
- 32 - 32.5
- 32.5 - 33
- 33 - 33.5
- 33.5 - 34
- 34 - 34.5
- 34.5 - 35

This map shows the
1.0% AEP +20% depth data



Sample point data

Defences removed climate change

Label	Easting	Northing	1% AEP (+20%)
			Depth
1	418397	426684	NoData
2	418423	426684	NoData
3	418449	426684	NoData
4	418475	426684	NoData
5	418501	426684	NoData
6	418397	426710	NoData
7	418423	426710	NoData
8	418449	426710	NoData
9	418475	426710	NoData
10	418501	426710	NoData
11	418423	426736	NoData
12	418449	426736	NoData
13	418475	426736	NoData
14	418501	426736	NoData
15	418423	426762	NoData
16	418449	426762	NoData

Label	Easting	Northing	1% AEP (+20%)
			Depth
17	418475	426762	NoData
18	418501	426762	NoData
19	418397	426788	NoData
20	418423	426788	NoData
21	418449	426788	NoData
22	418475	426788	NoData
23	418371	426814	NoData
24	418397	426814	NoData
25	418423	426814	NoData
26	418449	426814	NoData
27	418371	426840	NoData
28	418397	426840	NoData
Max value in selected area:			NoData

Data in this table comes from the 2009 FIM River Spen 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.

Strategic flood risk assessments

We recommend that you check the relevant local authority's strategic flood risk assessment (SFRA) as part of your work to prepare a site specific flood risk assessment.

This should give you information about:

- the potential impacts of climate change in this catchment
- areas defined as functional floodplain
- flooding from other sources, such as surface water, ground water and reservoirs

Your Lead Local Flood Authority is Kirklees.

About this data

This data has been generated by strategic scale flood models and is not intended for use at the individual property scale. If you're intending to use this data as part of a flood risk assessment, please include an appropriate modelling tolerance as part of your assessment. The Environment Agency regularly updates its modelling. We recommend that you check the data provided is the most recent, before submitting your flood risk assessment.

Flood risk activity permits

Under the Environmental Permitting (England and Wales) Regulations 2016 some developments may require an environmental permit for flood risk activities from the Environment Agency. This includes any permanent or temporary works that are in, over, under, or nearby a designated main river or flood defence structure.

[Find out more about flood risk activity permits](#)

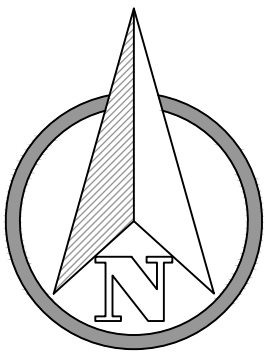
Help and advice

Contact the Yorkshire Environment Agency team at neyorkshire@environment-agency.gov.uk for:

- [more information about getting a product 5, 6, 7 or 8](#)
- general help and advice about the site you're requesting data for

APPENDIX D

PROPOSED DRAINAGE LAYOUT



TOPOGRAPHICAL NOTES:



The Topographical and buried services shown on this drawing were provided to Booth King by others. Booth King have not verified this information and therefore we can not guarantee its accuracy. The position and alignment of services may differ from that shown and other buried services may be present.

The contractor must verify the location of all buried services before any excavation or piling works begin. Damage to existing services could present a major health and safety risk plus associated commercial penalties.

Levels information shown is based on information available.
This office is to be made aware of any discrepancies found on site.

NOTES:

1. Do not scale from this drawing.
2. This drawing is copyright and is sent to you in confidence. It must not be copied, used or disclosed, in whole or in part, to third parties without written permission. It remains the property of Booth King Partnership Ltd. (BKPL) and must be returned on request.
3. This drawing is to be read in conjunction with all relevant contractual documents.
4. Anyone using this drawing must be aware of their legal duties under the CDM Regulations 2015, refer to the HSE website for further information. BKPL are not Principal Designers.
5. All dimensions shown on this drawing are in millimeters unless noted otherwise.
6. If the Contractor consider that they do not have sufficient information to safely complete the works detailed on this drawing, they should contact the Engineer.
7. This document uses revision codes in accordance with ISO EN 19650:
P, Preliminary (non-contractual) - review, comment or approval.
C, Contractual - Approved for stage completion.
8. This document uses status codes in accordance with ISO EN 19650:
Work in progress:
S0 - WIP
Shared (non-contractual):
S1 - Coordination, S2 - Information, S3 - Review, S4 & S5 - Approval.
Published (contractual):
A1, An, etc. (where "n" relates to the project stage)
9. This document uses project stages in accordance with the IStructE Structural Plan of Work 2020:
2 - Concept, 3 - Coordination, 4 - Technical Design,
4.5 - Production Design, 5 - Construction, 6 - Handover.
10. Only documents with a revision code C# (where '#' relates to a revision number) and status code A5 are suitable for construction.
Documents with status code A5 indicate final construction ONLY.
Any deviations to that which is on site is not the liability of BKPL.

FOR DETAILED PROPOSED DRAINAGE GA REFER TO:
15313-BKP-XX-XX-DR-C-0511 - PROPOSED DRAINAGE GA

C01	17.12.24	STAGE 3 - ISSUED FOR APPROVAL	PA
REV.	DATE	REVISION DETAILS	INITIALS
CURRENT DRAWING REVISION CHECKED BY			SP
CURRENT DRAWING REVISION APPROVED BY			AI
DRAWING STATUS:		PROJECT STAGE:	
S3		STAGE 3	

boothking
PARTNERSHIP LIMITED

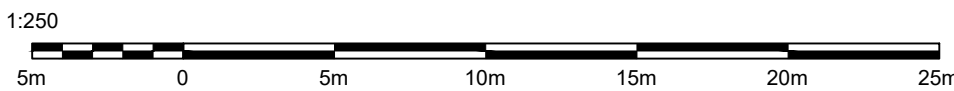
CONSULTING CIVIL & STRUCTURAL ENGINEERS
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RAMSBOTTOM MANCHESTER EDINBURGH
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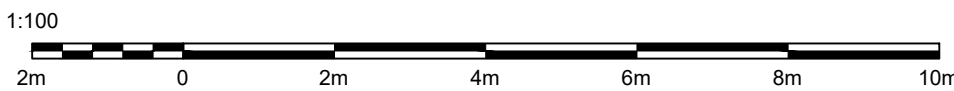
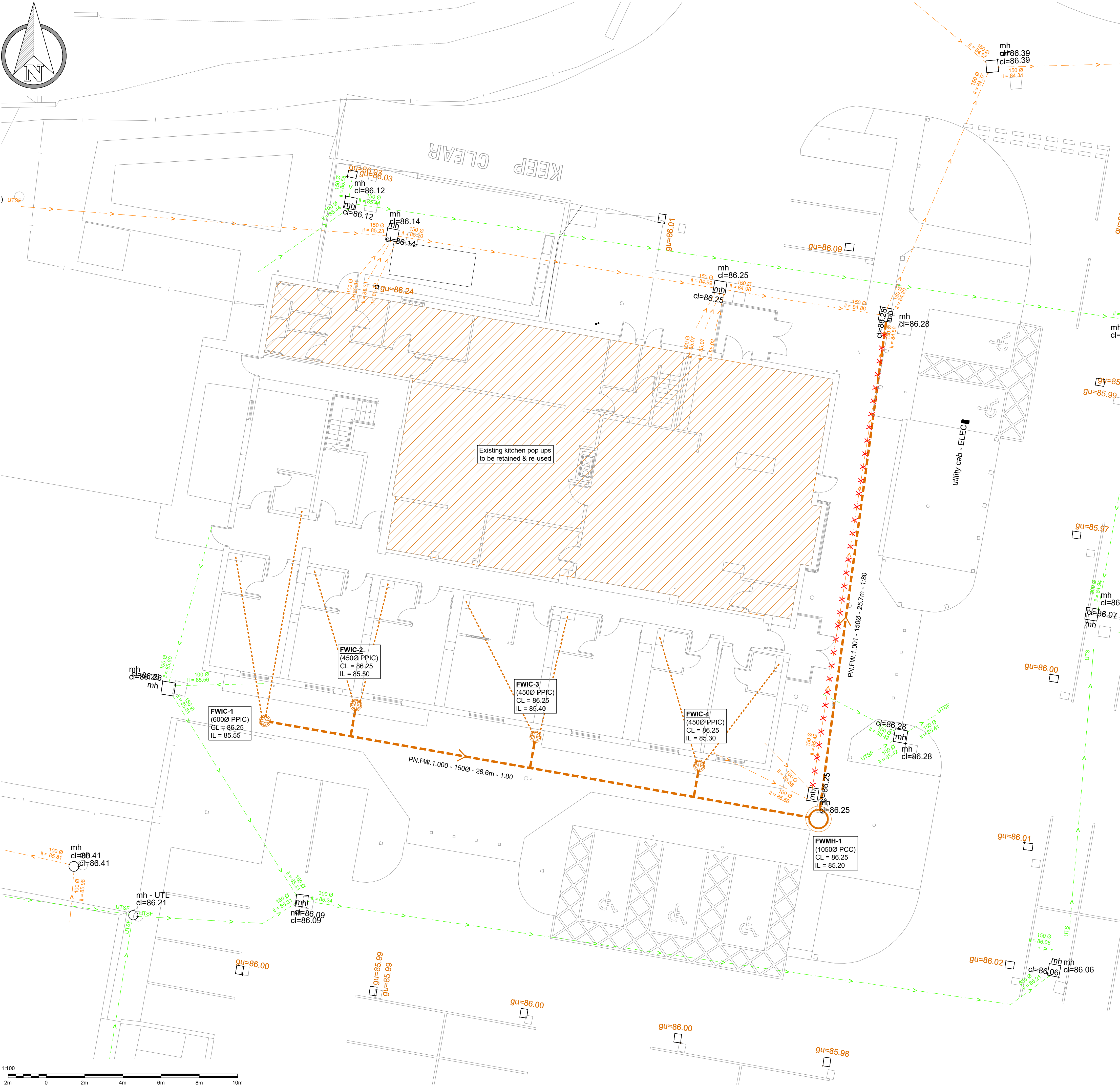
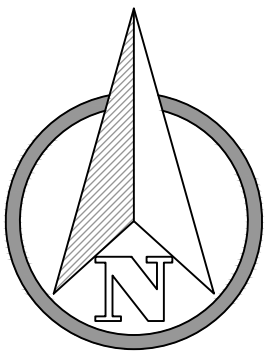
PROJECT:
**Premier Inn
Bradford South**

TITLE:
Proposed Drainage Key Plan

SCALE (A1)	AUTHOR	DATE	REVISION	BKPL No.
1:250	PA	Dec 24	C01	15313

DRAWING REF:
15313-BKP-XX-XX-DR-C-0510





TOPOGRAPHICAL NOTES:

The Topographical and buried services shown on this drawing were provided to Booth King by others. Booth King have not verified this information and therefore we can not guarantee its accuracy. The position and alignment of services may differ from that shown and other buried services may be present.

Levels information shown is based on information available. This office is to be made aware of any discrepancies found on site.

DRAINAGE NOTES:

- All adoptable works to be in accordance with SSG appendix C where applicable.
- All manhole cover levels to be confirmed by Architect.
- Clay pipes to be flexibly jointed and comply with the requirements of BS EN 295.
- Concrete pipes to be flexibly jointed and comply with the requirements of BSEN 1916 and BS 5911.
- Plastic pipes (PVC-U) to be flexibly jointed and comply with the requirements of BS EN 1401-1 1998.
- All surface water pipes to be laid at a gradient no flatter than 1:80 (UNO).
- All foul water pipes to be laid at a gradient no flatter than 1:40 (UNO).
- For minimum depths requiring pipe protection refer to drainage details drawings.
- Protection to drains and gully connections may be concrete bed surround between cover depths of 450mm to 200mm.
- Until final surface is placed, heavy traffic is not to be allowed over pipe trenches without special precautions.
- Pipes and fittings are to be laid in accordance with the manufacturers recommendations.
- All Manholes should be concrete manhole rings (UNO).
- All SVP & RWP positions TBC by Architect.
- Rodding access is to be provided at all pop-ups & RWPS.
- For setting out of all pop-up positions refer to Architect's details.
- Civil engineering contractor to arrange for:
 - Own services and temporary supplies.
 - Pathway & partial closure as deemed required by their method statement. Including costs.
 - Temporary adequate over pumping as deemed required by civil engineers method of construction.
- The contractor should confirm the locations for existing services prior construction.

DRAINAGE LINE TYPES KEY:

REF.	DESCRIPTION
---	Existing FW network
---	Existing SW network
- x x x x x -	Existing drainage to be grubbed up
---	Proposed FW network
---	Proposed SW network

DRAINAGE ANNOTATION KEY:

REF.	DESCRIPTION
SW	Surface water drainage
FW	Foul water drainage
CW	Combined water drainage
MH	Manhole
IC	Inspection chamber
PCC	Precast concrete chamber
PPIC	Polypropylene inspection chamber
GU	Gully
CL	Cover level (m)
IL	Invert level (m)
SVP	Soil vent pipe
PU	Pop up
RWP	Rainwater downpipe

NOTES:

- Do not scale from this drawing.
- This drawing is copyright and is sent to you in confidence. It must not be copied, used or disclosed, in whole or in part, to third parties without written permission. It remains the property of Booth King Partnership Ltd. (BKPL) and must be returned on request.
- This drawing is to be read in conjunction with all relevant contractual documents.
- Anyone using this drawing must be aware of their legal duties under the CDM Regulations 2015, refer to the HSE website for further information. BKPL are not Principal Designers.
- All dimensions shown on this drawing are in millimeters unless noted otherwise.
- If the Contractor consider that they do not have sufficient information to safely complete the works detailed on this drawing, they should contact the Engineer.
- This document uses revision codes in accordance with ISO EN 19650: P, Preliminary (non-contractual) - review, comment or approval. C, Contractual - Approved for stage completion.
- This document uses status codes in accordance with ISO EN 19650: Work in progress: S0 - WIP Shared (non-contractual): S1 - Coordination, S2 - Information, S3 - Review, S4 & S5 - Approval. Published (contractual): A1, An, etc. (where "n" relates to the project stage)
- This document uses project stages in accordance with the IStructE Structural Plan of Work 2020: 2 - Concept, 3 - Coordination, 4 - Technical Design, 4.5 - Production Design, 5 - Construction, 6 - Handover.
- Only documents with a revision code C# (where '#' relates to a revision number) and status code A5 are suitable for construction. Documents with status code A5 indicate final construction ONLY. Any deviations to that which is on site is not the liability of BKPL.

C01	17.12.24	STAGE 3 - ISSUED FOR APPROVAL	PA
REV.	DATE	REVISION DETAILS	INITIALS
			SP
			AI

DRAWING STATUS:	PROJECT STAGE:
S3	STAGE 3

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PROJECT:
**Premier Inn
Bradford South**

TITLE:
Proposed Drainage GA

SCALE (A1) | AUTHOR | DATE | REVISION | BKPL No.
1:100 | PA | Dec 24 | C01 | 15313

DRAWING REF:
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