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Client: Hyde Park Construction Ltd

Flood Risk Assessment for the Proposed Development at Haydon House, 296 Joel Street, Pinner, London

May 2022

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2	1	Final report issued by email	20 May 2022
3	2	Report updated to include latest scheme drawings. Revised report issued by email	25 May 2022

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1 Background and Scope of Appraisal

Flooding is a major issue in the United Kingdom. The impacts can be devastating in terms of the cost of repairs, replacement of damaged property and loss of business. The objectives of the Flood Risk Assessment (FRA) are therefore to establish the following:

- whether a proposed development is likely to be affected by current or future flooding from any source.
- whether the development will increase flood risk elsewhere within the floodplain.
- whether the measures proposed to address these effects and risks are appropriate.
- whether the site will pass Part B of the Exception Test (where applicable).

Herrington Consulting has been commissioned by Hyde Park Construction Ltd to prepare a Flood Risk Assessment (FRA) for the proposed development at **Haydon House 296 Joel Street, Pinner, London, HA5 2PY.**

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

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

2 Development Description and Planning Context

2.1 Site Location Development

The site is located at OS coordinates 510447, 188870 off Joel Street in Pinner. The site covers an area of approximately 740m^2 and currently comprises a three-storey office building, within the wider residential area. The location of the site in relation to the surrounding area and the River Pinn is shown in Figure 2.1.

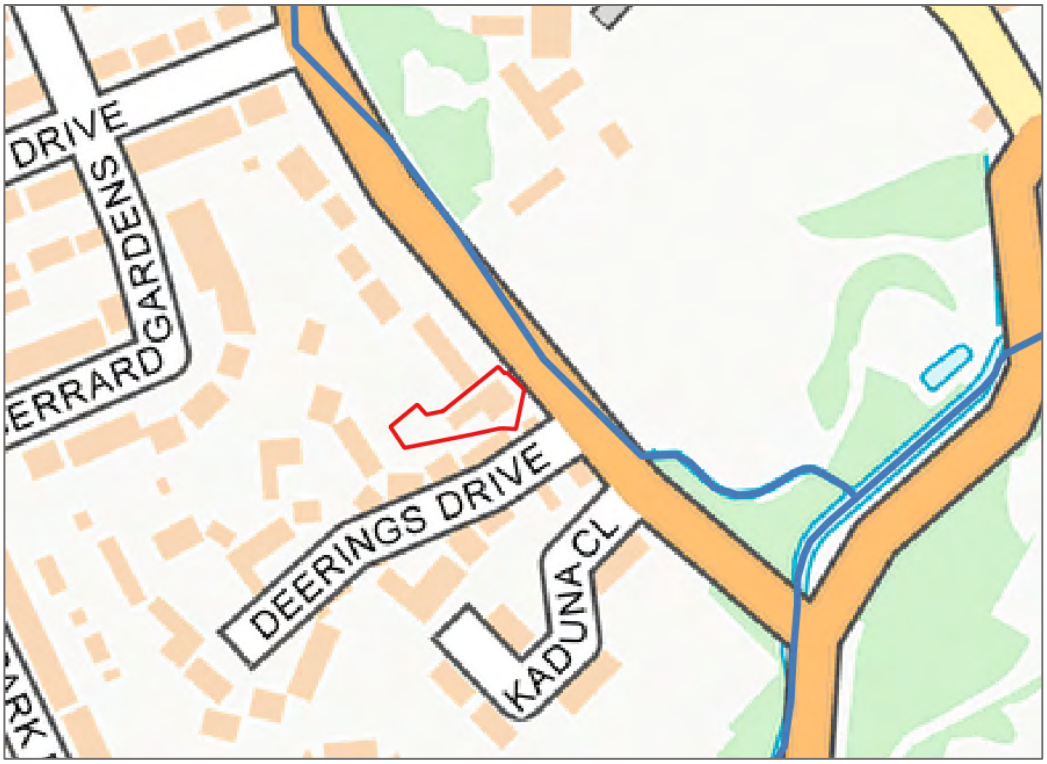


Figure 2.1 – Location map (contains Ordnance Survey data © Crown copyright and database right 2022). River Pinn shown in blue, site boundary delineated in red.

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

2.2 Proposed Development

The proposals for development comprise the change of use of the building from an office space into 7no residential flats (Figure 2.2).

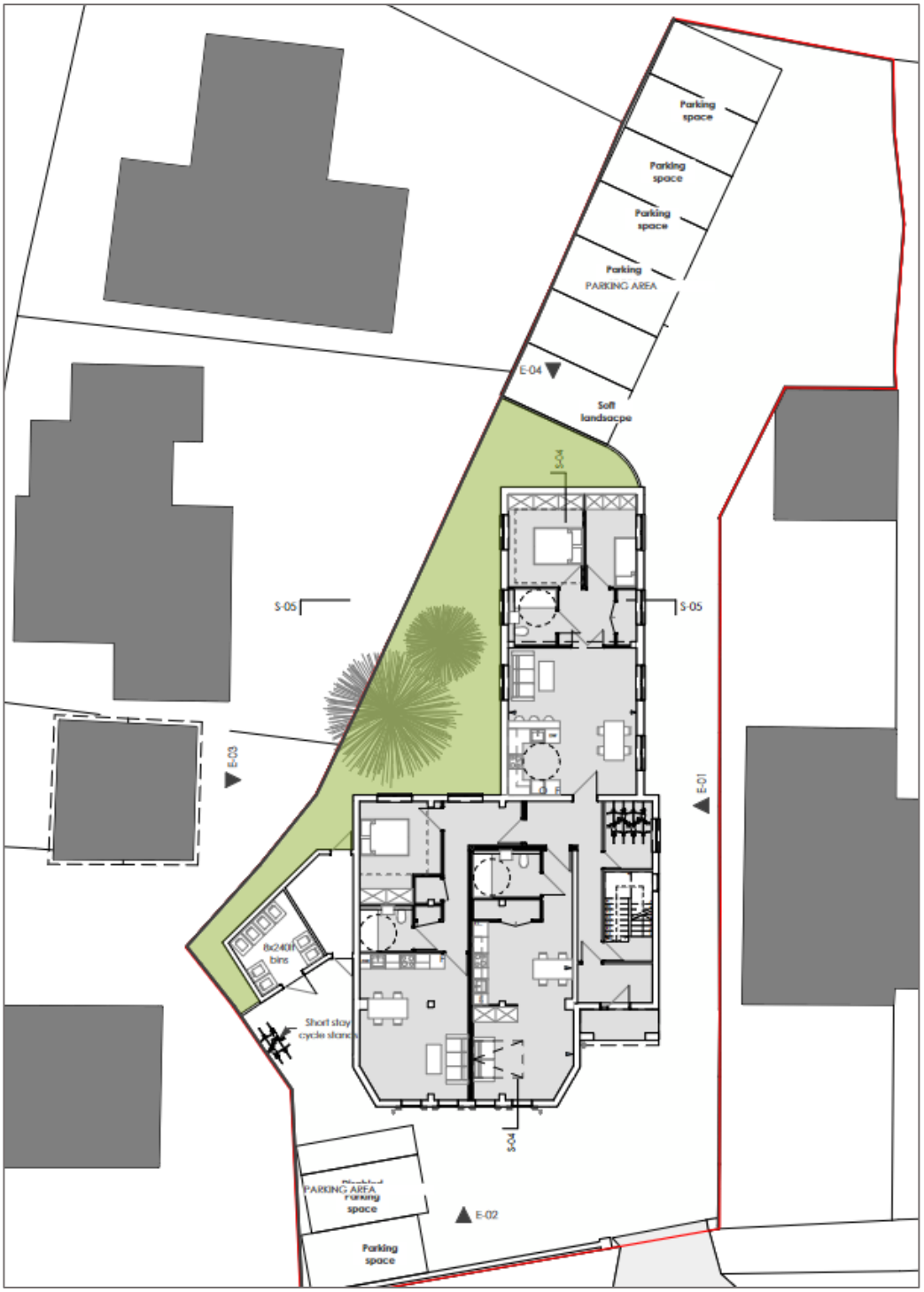


Figure 2.2 – Proposed ground floor plan

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

2.3 The Sequential Test and Exception Test

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

In this circumstance the proposed development is for the change of use of the existing building. Paragraph 168 of the National Planning Policy Framework (NPPF) states that such applications need not be subject to the Sequential Test and therefore, by default, the Exception Test is not required either.

Notwithstanding this, the NPPF does require all development located within Flood Zones 2 and 3 to be subject to a site-specific FRA and to meet the requirements for flood risk reduction. The following assessment identifies that the subject site is located within Flood Zone 2 and 3 (Figure 2.3), and therefore the primary focus of this document is to appraise the risk of flooding from all key sources.

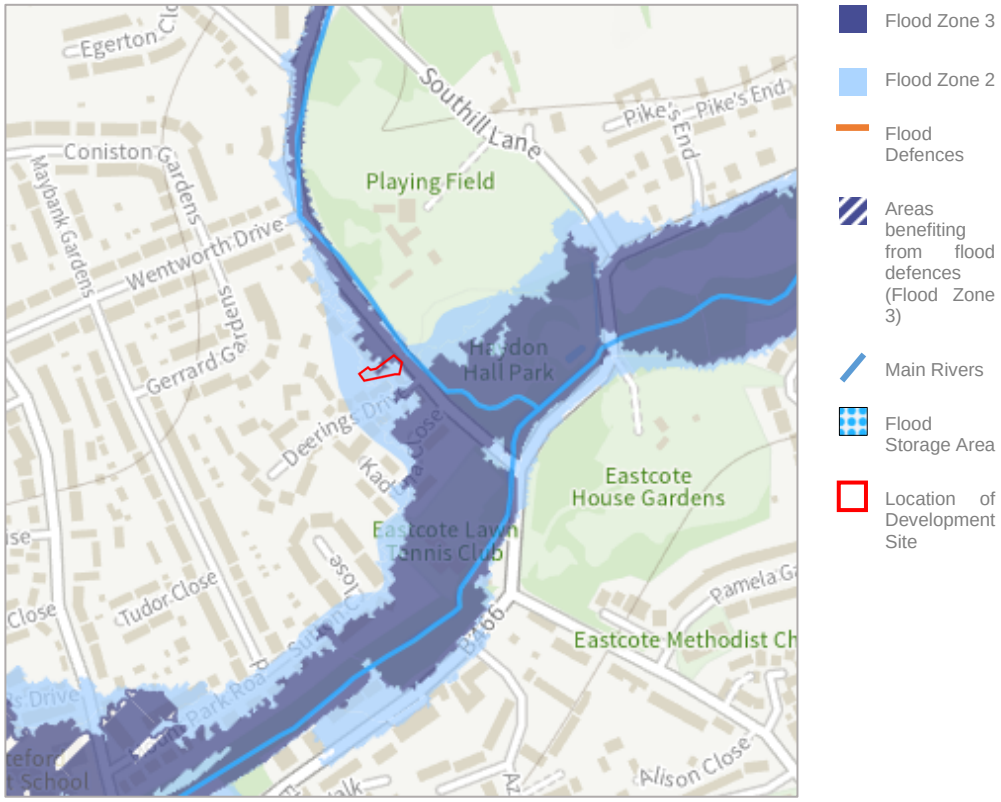


Figure 2.3 – EA's 'Flood Map for Planning' (© Environment Agency).

3 Definition of Flood Hazard

3.1 Site Specific Information

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

Site specific flood level data provided by the EA – The EA has been contacted to request modelled flood level information and a copy of their response is included in Appendix A.2 of this report. The EA has also provided the model results of the River Pinn Modelling and Mapping Study carried out in 2016 (by others), which have been referenced as part of this appraisal.

Information contained within the SFRA – The West London SFRA (2018) contains detailed mapping showing historic flood records for a wide range of sources. This document has been referenced as part of this site-specific FRA.

Information on localised flooding contained within the SWMP – A Surface Water Management Plan (SWMP) is a study to understand the risk of flooding that arises from local surface water flooding, which is defined by the Flood and Water Management Act 2010 as flooding from surface runoff, groundwater, and ordinary watercourses. Such a document has been prepared for London Borough of Hillingdon (2014) and has therefore been referenced as part of this site-specific FRA.

Information provided by Thames Water –Thames Water has provided the results of an asset location search for the site. The response is included in Appendix A.3.

Site specific topographic surveys – A topographic survey has been undertaken for the site and a copy of this is included in Appendix A.1. From the survey, it can be seen that the level of the site varies between 44.10m and 45.34m Above Ordnance Datum Newlyn (AODN), and the ground floor level of the building is taken as 44.49m AODN.

Geology – Reference to the British Geological Survey (BGS) map shows that the underlying solid geology in the location of the subject site is Lambeth Group (clay, silt and sand). There are no overlying superficial deposits.

Historic flooding – The EA 'Recorded Flood Outlines' GIS layer indicates that the site is located within the extent of a flood event that took place in 1977.

3.2 Potential Sources of Flooding

The main sources of flooding have been assessed as part of this appraisal. The specific issues relating to each one and its impact on this development are discussed below. Table 3.1 at the end of this section summarises the risks associated with each of the sources of flooding.

Flooding from Rivers,* Ordinary or Man-Made Watercourses *(Fluvial) – The site lies within Flood Zone 3 of the River Pinn (main river) as shown on the EA's 'Flood Map for Planning' (Figure

2.3). These maps are used as a consultation tool by planners to highlight areas where more detailed investigation into the risk of flooding is required. Consequently, the risk of flooding from this source has been examined in more detail in Section 5 of this FRA.

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

Flooding from Surface Water – Surface Water, or overland, flooding typically occurs in natural valley bottoms as normally dry areas become covered in flowing water and in low spots where water may pond. This mechanism of flooding can occur almost anywhere but is likely to be of particular concern in any topographical low spot, or where the pathway for runoff is restricted by terrain or man-made obstructions.

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

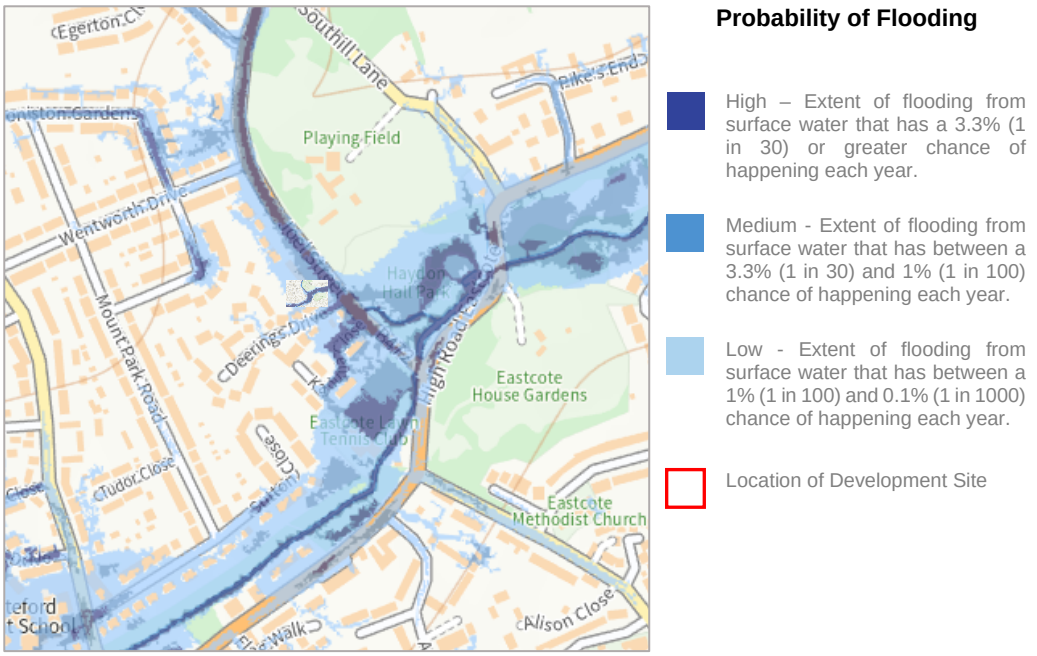


Figure 3.1 – EA's 'Flood Risk from Surface Water' map (© Environment Agency).

However, the EA mapping does not consider the influence of the adjacent River Pinn, which would act to drain surface water away from the site. Therefore, the EA mapping is considered to be an overestimate of the risk of flooding from surface water.

If the watercourse was full to capacity following an extreme rainfall event, the lower lying areas surrounding the watercourse could be subject to flooding, however, this would be attributed to flooding from fluvial sources. The risk of flooding from fluvial sources is therefore discussed above and is assessed further in Section 5.

Overall, given that there are no known records of surface water flooding on site within the SFRA and there are no topographical low points within the site boundary, it is concluded that the risk from surface water flooding is *low*.

Flooding from Groundwater – Water levels below the ground rise during wet winter months and fall again in the summer as water flows out into rivers. In very wet winters, rising water levels may lead to the flooding of normally dry land, as well as reactivating flow in 'bournes' (streams that only flow for part of the year).

Groundwater flooding is most likely to occur in low-lying areas that are underlain by permeable rock (aquifers). The underlying geology in this area is Lambeth Group (clay, silt, and sand), which is typically impermeable and not usually associated with groundwater flooding.

This is supported by BGS groundwater flood risk mapping data which shows that the general area in which the development site lies is identified as being at low risk from groundwater flooding and by mapping on groundwater emergence provided as part of the Defra Groundwater Flood Scoping Study (May 2004) which shows that the site itself is not located within an area where groundwater emergence is predicted.

Furthermore, no groundwater flooding events were recorded during the very wet periods of 2000/01 or 2002/03 and the SFRA also identifies that there are no historic records of groundwater flooding onsite in the past. Consequently, the risk of groundwater flooding is considered to be *low.*

Flooding from Sewers – In urban areas, rainwater is typically drained into surface water sewers or sewers containing both surface and wastewater known as "combined sewers". Flooding can result when the sewer is overwhelmed by heavy rainfall, becomes blocked, or has inadequate capacity; this will continue until the water drains away.

Inspection of the asset location mapping provided by Thames Water (Figure 3.2) identifies that the sewers in this area are foul and surface water.

The historic records set out in the London Borough of Hillingdon SWMP identify that the site falls within a large region which has experienced greater than 5 incidents of flooding from sewers prior to 2010. However, the sewer flooding data used in the SWMP (provided by Thames Water) is relatively coarse and is limited to postcode data. Consequently, the area shown by the SFRA to have been affected by sewer flooding in the past is comparatively large, when in reality these recorded flood events are likely to be smaller isolated incidents. This is supported by the fact that there are no known records of the site being affected by sewer flooding within the SFRA.

Furthermore, the topography of the land within the site and the surrounding area suggests that any above ground flooding that might occur as a result of a surcharged sewer would not pond at the site but would rather flow southeast along Joel Street. The risk of flooding from this source is therefore considered to be *low*.

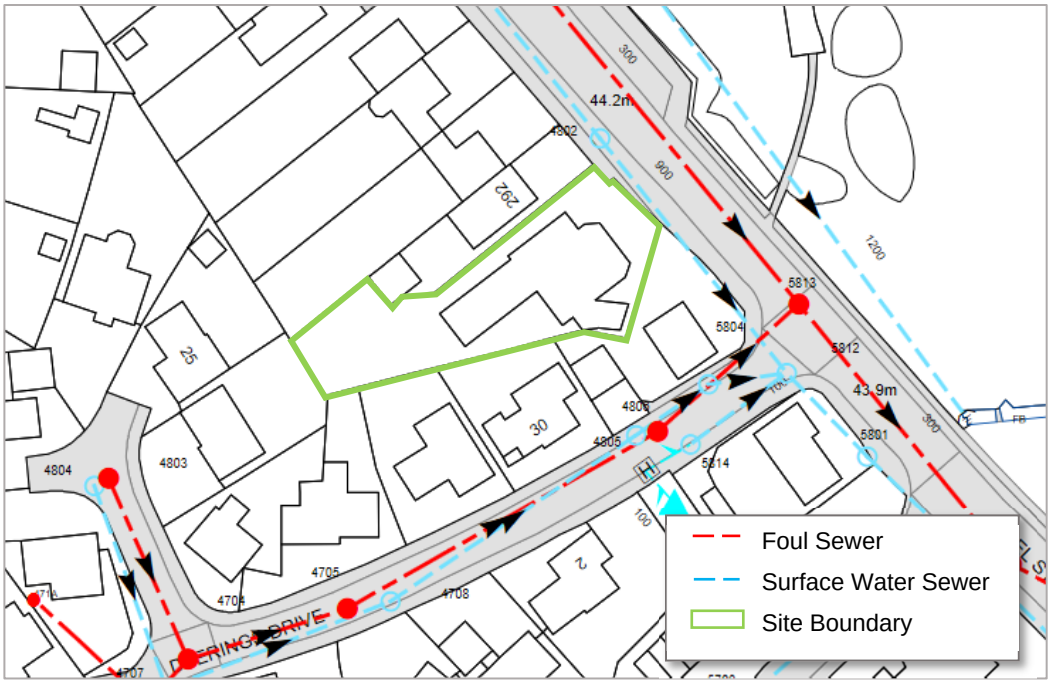


Figure 3.2 - Asset location mapping provided by Thames Water (a full-scale copy can be found in Appendix A.3).

Flooding from Reservoirs, Canals, and Other Artificial Sources – Non-natural or artificial sources of flooding can include reservoirs, canals, and lakes, where water is retained above natural ground level. In addition, operational and redundant industrial processes including mining, quarrying, sand, and gravel extraction, may also increase the depth of floodwater in areas adjacent to these features.

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

Inspection of the Ordnance Survey mapping for the area shows that there are no artificial sources of flooding within close proximity to the site. However, the EA's 'Flood Risk from Reservoirs' map (Figure 3.3) shows that the site is located within an area considered to be at risk of flooding from the failure of the King George Reservoir when there is also flooding from rivers, which is located approximately 27km from the site.

When considering the risk of flooding from this source it is necessary to consider the fact that these reservoirs are located a significant distance from the site and are owned and operated by the relevant water companies, who have a duty under the Reservoirs Act to ensure that they are maintained in a good working order and are inspected regularly. Consequently, due to the high standard of protection the risk of flooding from these man-made water bodies is considered to be *low*.

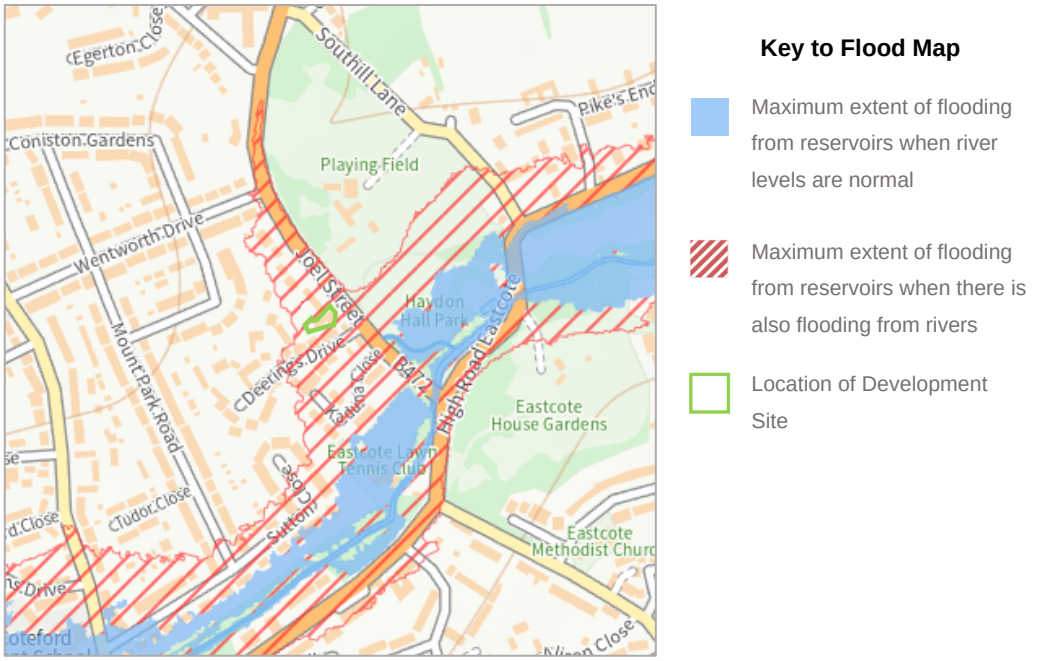


Figure 3.3 – EA's 'Risk of Flooding from Reservoirs' map (© Environment Agency).

A summary of the overall risk of flooding from each source is provided in Table 3.1 below.

Source of Flooding	Initial Level of Risk	Appraisal method applied at the initial flood risk assessment stage
Rivers, Ordinary or Man-Made watercourses	Appraised further in Section 5	OS mapping, aerial height data and the EA's 'Flood Map for Planning'
Sea	Low	OS mapping and aerial height data
Surface Water	Low	EA's 'Flood Risk from Surface Water' map, and historic records contained within the London Borough of Hillingdon SWMP, aerial height data, OS mapping and site-specific topographic survey
Groundwater	Low	BGS groundwater flood hazard maps, Defra Groundwater Flood Scoping Study, aerial height data, OS mapping, and site-specific topographic survey
Sewers	Low	Aerial height data, OS mapping, site-specific topographic survey, asset location data provided by Thames Water and historic sewer records contained within the SWMP
Artificial Sources	Low	OS mapping and EA's 'Flood Risk from Reservoirs' map

Table 3.1 – Summary of flood sources and risks.

3.3 Existing Flood Risk Management Measures

The EA's 'Spatial Flood Defence' GIS layer indicates that the site benefits from an area of high ground alongside the river Pinn, which acts as a flood defence for the property.

4 Climate Change

The global climate is constantly changing, but it is widely recognised that we are now entering a period of accelerating change. Over the last few decades there have been numerous studies into the impact of potential changes in the future and there is now an increasing body of scientific evidence which supports the fact that the global climate is changing as a result of human activity. Past, present, and future emissions of greenhouse gases are expected to cause significant global climate change during this century.

The nature of climate change at a regional level will vary for the UK, projections of future climate change indicate that more frequent short-duration, high-intensity rainfall, and more frequent periods of long-duration rainfall could be expected.

These effects will tend to increase the size of Flood Zones associated with rivers, and the amount of flooding experienced from other inland sources. The rise in sea level will change the frequency of occurrence of high-water levels relative to today's sea levels. It will also increase the extent of the area at risk should sea defences fail. Changes in wave heights due to increased water depths, as well as possible changes in the frequency, duration and severity of storm events are also predicted.

4.1 Planning Horizon

To ensure that any recommended mitigation measures are sustainable and effective throughout the lifetime of the development, it is necessary to base the appraisal on the extreme flood level that is commensurate with the planning horizon for the proposed development. The NPPF and supporting Planning Practice Guidance Suite state that residential development, such as the proposed development, should be considered for a minimum of 100 years.

4.2 Potential Changes in Climate

Peak River Flow

Recognising that the impact of climate change will vary across the UK, the allowances show the anticipated changes to peak flow by management catchment. Management catchments are sub-catchments of river basin districts. The proposed development site is covered by the **Thames River Basin District**, as defined by the EA 'River Basin District' maps, and is located in the **London Management Catchment**, as defined on the EA's 'Peak River Flow' map.

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

- Central: based on the 50th percentile
- Higher Central: based on the 70th percentile
- Upper End: based on the 95th percentile

The EA has provided guidance regarding the application of the climate change allowances and how they should be applied in the planning process. The range of allowance for the Management Catchment in which the development site is located are shown in Table 4.1 below.

Management Catchment Name (River Basin District)	Allowance Category	2020s	2050s	2080s
London (Thames)	Upper End	26%	30%	54%
	Higher Central	14%	14%	27%
	Central	10%	7%	**17%**

Table 4.1 – Recommended peak river flow allowances for each epoch for the London Management Catchment (1981 to 2000 baseline).

For 'more vulnerable' development with a design life of 100 years in Flood Zone 3a, a **Central** climate change allowance is recommended. From Table 4.1 above, it can be seen that the recommended climate change allowance for this site is a **17%** increase for all peak river flows.

5 Probability and Consequence of Flooding

5.1 The Likelihood of Flooding

When appraising the risk of flooding to new development it is necessary to assess the impact of the 'design flood event'. Flood conditions can be predicted for a range of return periods, and these are expressed in either years or as a probability, i.e., the probability that the event will occur in any given year, or Annual Exceedance Probability (AEP). The design flood event is taken as the 1 in 100 year (1% AEP) event for fluvial flooding, including an appropriate allowance for climate change (refer to Section 4.2).

The EA has previously provided the modelling outputs from the River Pinn Modelling Study (2015) which has been referenced as part of this appraisal. A summary of the maximum predicted flood level at the site for the key return period events is provided in Table 5.1 below.

Return Period in Years (% AEP)	Modelled Flood Levels (m AODN)
1 in 20 year (5%)	-
1 in 100 year (1%)	44.31
1 in 100 year + 25% allowances for climate change (1% +25CC)	44.41

Table 5.1 – – Modelled flood levels provided by the EA. A value of "- "indicates the site is not subject to flooding during this event.

The 1 in 20 year Flood Event – Functional Floodplain

The functional floodplain is defined by the NPPF as land where water has to flow or be stored in times of flood during events that have a probability of occurrence of 1 in 20 (5%) or greater in any one year. From Table 5.1 it is evident that the development is not located within the functional floodplain.

The Design Flood Event

When appraising the risk of flooding to new development it is necessary to assess the impact of the 'design flood event'. The design flood event is taken as the 1 in 100 year (1% AEP) event for fluvial flooding, including an appropriate allowance for climate change (refer to Section 4.2).

Section 4.2 has identified that for a more vulnerable development situated within Flood Zone 3, a 17% increase in peak river flow has to be applied to the 1 in 100 year flood event to account for climate change throughout the lifetime of the development (i.e. design flood event). As the guidance on climate change allowances has recently been updated, this scenario has not been modelled as part of the River Pinn Modelling Study. In absence of an event with the recommended allowance, a conservative approach has been adopted, by applying the 1 in 100 year return period event including a 25% allowance for climate change (i.e. the closest available modelled climate change scenario to the recommended allowance) as the design flood event.

This scenario has been modelled by the EA and reference to Table 5.1 above shows that the design flood level for the development site is **44.41m AODN**. When this level is compared to aerial height data it can be seen that the maximum predicted depth of flooding on the site is 0.31m AODN, which is at the lowest point on the site at the front of the property (Figure 5.1).

When the flood level is compared to the more detailed information included within the topographic survey it is evident that the ground flood level of the building is above the predicted flood level during the design event. As a result, the building is not predicted to be subject to flooding during the design flood event.

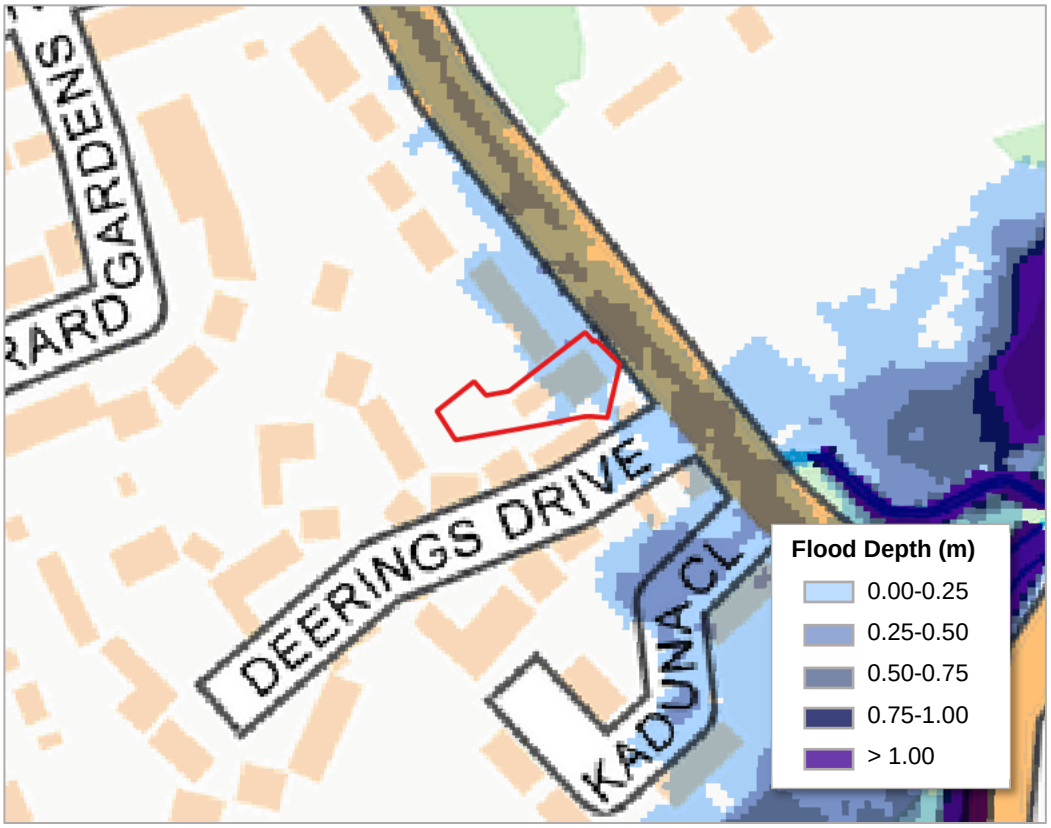


Figure 5.1 – Maximum predicted extent and depth of flooding during the design flood event. (© Environment Agency - contains Ordnance Survey data © Crown copyright and database right 2022).

5.2 Time to Inundation

Inspection of the model files identifies that it takes 2 hours for floodwater to reach the site from the point at which floodwater first exits the channel near to the site. It takes a further 30 minutes before the maximum flood level on site is reached.

6 Offsite Impacts and Other Considerations

6.1 Displacement of Floodwater

The development proposals simply comprise a change of use and do not include the construction of any additional structures. As such, the proposed development will not displace any additional floodwater which could otherwise have a negative impact on the surrounding area.

6.2 Public Safety and Access

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

It has been identified that part of the site and the access road (Joel Street) could be subject to flooding under the design event. Inspection of the hazard mapping outputs provided by the EA show that the site is located in an area classified as having a 'low' hazard rating and therefore residents would be able to move about the site. However, the hazard classification for Joel Street ranges from 'low' to 'significant', and therefore safe access to the wider area may not be available at the peak of the design event. It is therefore recommended that residents sign up to the EA's flood warning service to ensure they are aware of conditions which could result in flooding (refer to section 7.2).

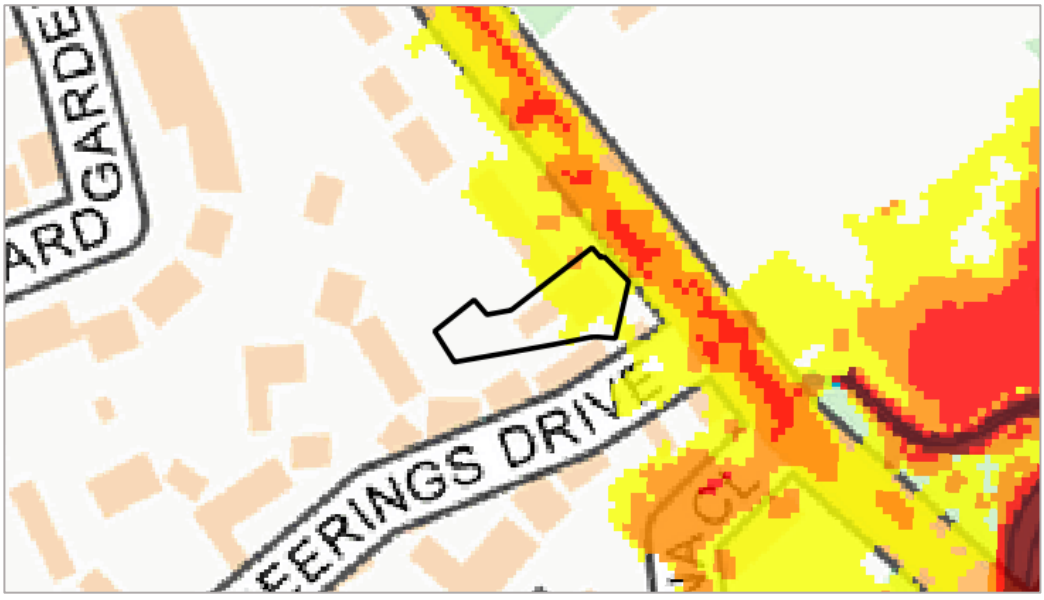


Figure 6.1 Flood Hazard Rating mapping extracted from the River Pinn Modelling Study. Site boundary shown in black. Refer to Table 6.1 for the key.

Hazard Rating (HR)	Degree of Flood Hazard	Description
< 0.75	Low	Caution – shallow flowing water or deep standing water
0.75 to 1.25	Moderate	Dangerous for some, i.e., children – deep or fast flowing water
1.25 to 2.0	Significant	Dangerous for most people – deep fast flowing water
> 2.0	Extreme	Dangerous for all – extreme danger with deep and fast flowing water

Table 6.1 – Classification of Hazard Rating Thresholds.

6.3 Proximity to Watercourse

Under the Water Resources Act 1991 and Land Drainage Byelaws, any proposals for development in close proximity to a 'main river' would need to consider the EA's requirement for an 8m buffer zone between the riverbank and any permanent construction such as buildings or car parking etc.

The development site is located more than 8m from the River Pinn, therefore will not compromise any of the EA's maintenance or access requirements.

7 Flood Mitigation Measures

The key objectives of flood risk mitigation are:

- to reduce the risk of the development being flooded.
- to ensure continued operation and safety during flood events.
- to ensure that the flood risk downstream of the site is not increased by increased runoff.
- to ensure that the development does not have an adverse impact on flood risk elsewhere.

The following section of this report examines ways in which the risk of flooding at the development site can be mitigated.

Mitigation Measure	Appropriate	Comment
Careful location of development within site boundaries (i.e., Sequential Approach)	X	There is limited opportunity to apply this approach.
Land raising	X	
Alterations/ improvements to channels and hydraulic structures	X	It is not considered necessary to include these measures in this instance.
Flood defences	X	
Raising floor levels	X	Refer to Section 7.1
Compensatory floodplain storage	X	Not required - Refer to section 6.1
Flood resistance & resilience	✓	Refer to Section 7.2
Flood warning	✓	Refer to Section 7.3
Surface water management	X	The proposals are for the change of use of the existing building and therefore will not increase the rate of discharge of surface water runoff from the site.

Table 7.1 – Appropriateness of mitigation measures.

7.1 Raising Floor Levels

In this instance, as the proposals are for the change of use of the existing building there is no opportunity to raise the floor levels of the building. However, it should be acknowledged that the existing ground floor is elevated above the flood level and therefore not predicted to be subject to flooding during the design flood event Despite this, flood resistance and resilience measures are proposed to be included within the design of the building (Refer to Section 7.2).

7.2 Flood Resistance and Resilience

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

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

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

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

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

It has been demonstrated that the ground floor of the existing building is elevated above the design flood level and therefore internal flooding is not expected. Nevertheless, it is recommended that flood resistance and resilience measures are retrofitted where possible into the existing building as a precautionary measure.

The National Flood Forum provides advice to property owners on flood resistance and resilience measures which can be retrofitted into an existing building. Advice can be found on their website at:

https://nationalfloodforum.org.uk/

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

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

7.3 Flood Warning

The EA operate a flood forecasting and warning service in areas at risk of flooding from rivers or the sea, which relies on direct measurements of rainfall, river levels, tide levels, in-house predictive models, rainfall radar data and information from the Met Office. This service operates 24 hours a day, 365 days a year.

It has been demonstrated that the ground floor is not predicted to flood during the design flood event, however, this forewarning will ensure that residents area aware of conditions which could result in flooding on site or within the access road. The warnings could be sufficient to either allow residents to evacuate the area or prepare themselves and their property for a flood event. It is therefore recommended that the residents of the site sign up to the EA's Flood Warning Service either by calling 0345 988 1188, or by visiting.

www.gov.uk/sign-up-for-flood-warnings

8 Conclusions and Recommendations

The aim of this report is to determine whether the proposed development at Haydon House 296 Joel Street, Pinner, London**,** is sustainable in terms of flood risk and how mitigation measures can be incorporated into the building to ensure the development is safe for its lifetime.

The proposals for development are for the change of use of the existing building from office space to 7no. residential flats. The NPPF states that developments of this kind do not need to be subject to the Sequential test, nor the Exception Test. Notwithstanding this, the NPPF does require all developments within Flood Zones 2 and 3 to be subject to an FRA, to seek opportunities to reduce the risk of flooding.

The risk of flooding has been considered across a wide range of sources and it has been identified that site is at low risk of flooding from all sources. The exception to this is that, whilst the ground floor of the building is elevated above the flood level, the site could be subject to flooding from the River Pinn during the design flood event. As a result, the following mitigation measures are recommended:

- **Flood resistance and resilience measures should be retrofitted where possible**. Whilst the floor level of the building is above the flood level, it is recommended that flood resistance and resilience measures be retrofitted as a precautionary measure to manage the impact on floodwater on the structure below the flood level.

- **The residents should sign up to receive the EAs Flood Warnings**. The EA's flood warnings will provide forewarning of extreme weather conditions which may result in flooding occurring. Forewarning will enable the residents to evacuate to an area located outside the predicted extent of flooding. If it is not possible to evacuate before floodwater reaches the site, safe refuge will be available within the building, which is located above the design flood level.

With the above mitigation measures incorporated into the design of the development, the proposals will meet the requirements of the NPPF and its Planning Practice Guidance and will therefore be acceptable and sustainable in terms of flood risk

9 Appendices

Appendix A.1 – Drawings

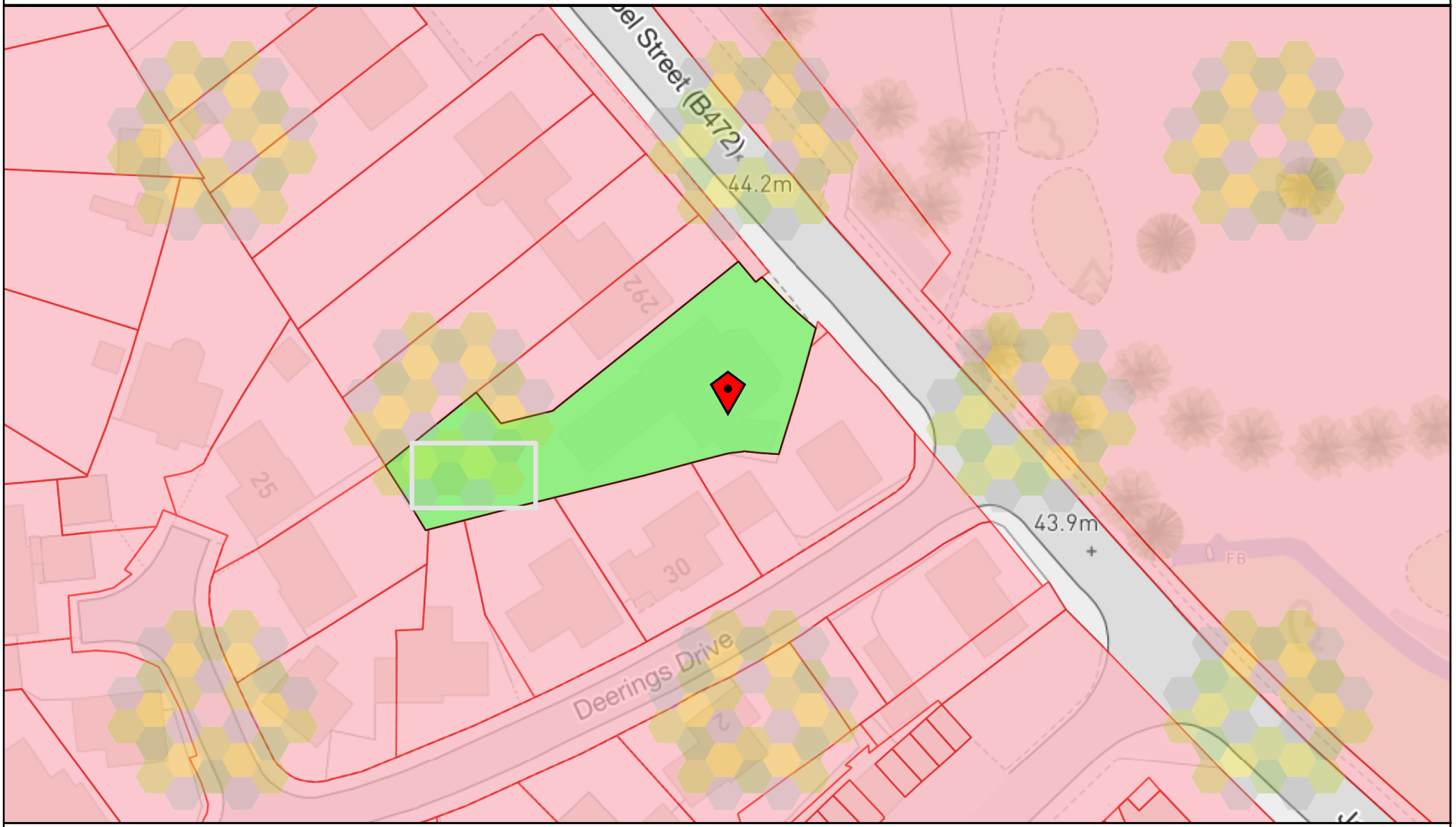
Appendix A.2 – Environment Agency Flood Report

Appendix A.3 – Thames Water Asset Location Data

Appendix A.1 – Drawings

BETA HM Land Registry

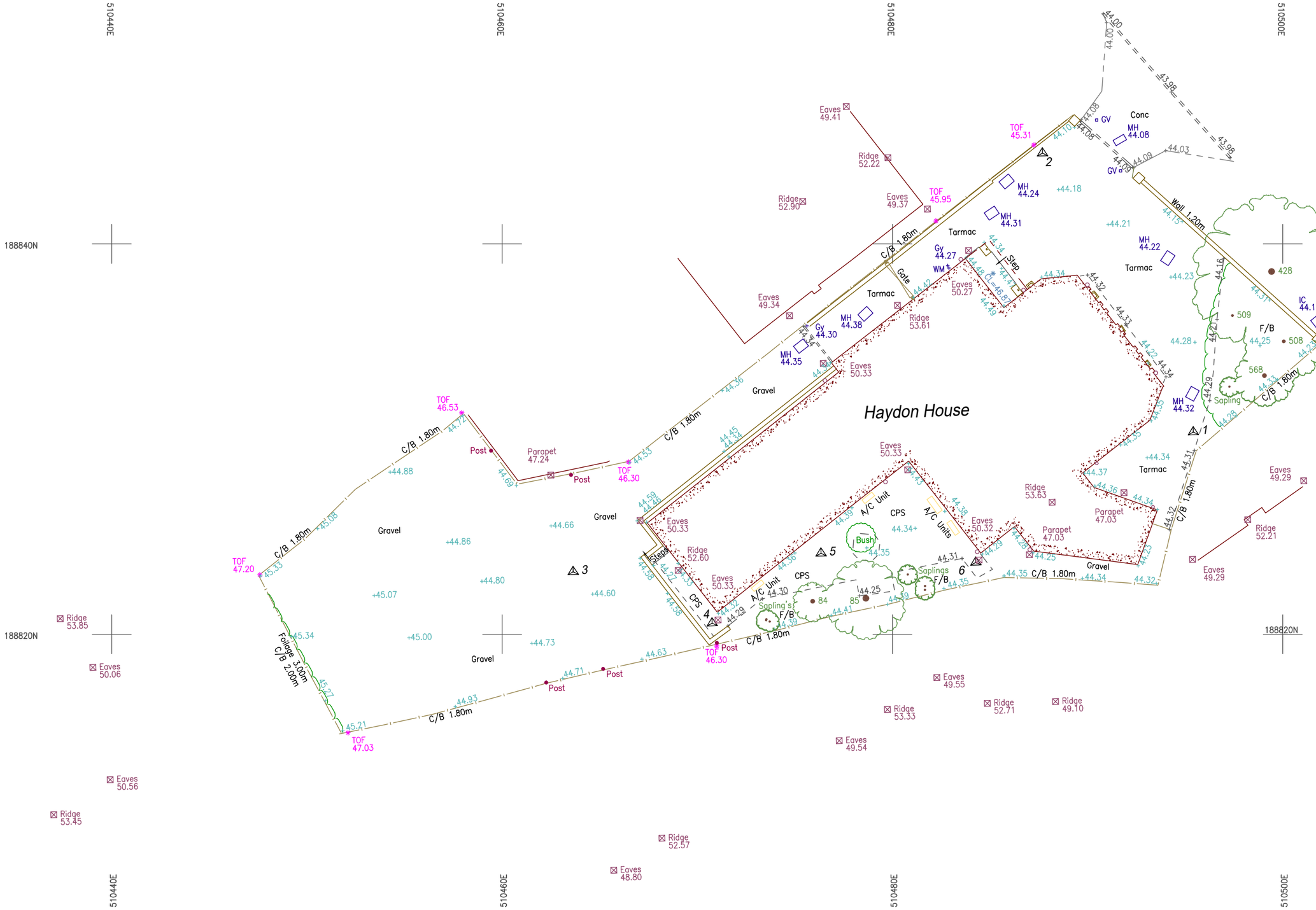
MapSearch Snapshot



0 2 4 6 8 12 16 20m

Map scale 1:625

Data last updated 10:00pm 25 NOVEMBER, 2021



Survey Legend

FENCES

BARBED WIRE FENCE	B/W	Trees	
CORRUGATED IRON FENCE	C/I		
CLOSE BOARD FENCE	C/B	Hedges	Privet 1.2
CHESTNUT PALING FENCE	C/P		
IRON RAILING FENCE	I/R		
POST AND CHAIN FENCE	P/C		
POST AND RAIL FENCE	P/R	Walls	Wall 2.0m (Width to Scale)
POST AND WIRE FENCE	P/W		
CHAIN LINK FENCE	C/L		
LARCH LAP FENCE	L/L	Fences	C/B 1.8m
INTERWOVEN FENCE	I/W		
WIRE MESH FENCE	W/M		

ABBREVIATIONS

BOLLARD	Bo	MARKER	Mk
BRITISH TELECOM IC	BT	NOTICE BOARD	NB
CONCRETE PAVING SLABS	CPS	PARKING METER	PM
COVER LEVEL	CL	ROAD NAME PLATE	RNP
DROP KERB	DK	ROAD SIGN	RS
ELECTRIC INSPECTION COVER	EC	RODDING EYE	RE
ELECTRICITY POLE	EP	RETAINING WALL	Rtw
FIRE HYDRANT	FH	RAINWATER PIPE	RWP
FLOWER BED	FB	STOP VALVE	SV
FOOTPATH	FP	TELEGRAPH POLE	TP
GAS VALVE	GV	TELEPHONE CALL BOX	TCB
GULLY	Gy	TRAFFIC LIGHT	TL
INSPECTION COVER	IC	UNABLE TO LIFT	UTL
PIPE INVERT LEVEL	IL	UNKNOWN	Unk
KERB OUTLET	KO	VENT PIPE	VP
MAN HOLE	MH	WATER METER	WM
THRESHOLD	TH	DIAMETER	Ø

Tree Schedule

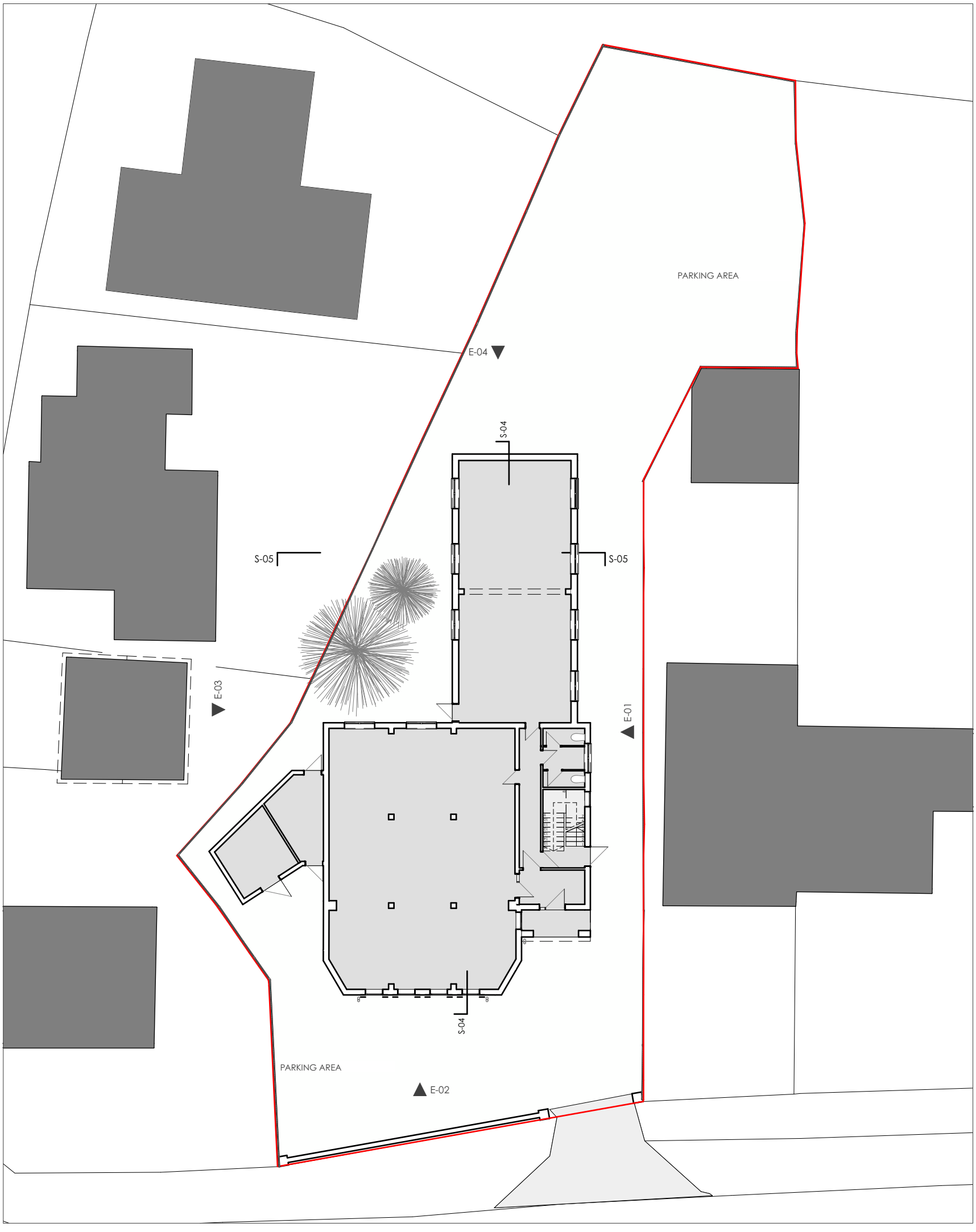
Pt No	Spread	Bole	Height	Feature
84	2.0	0.20	5.0	HOLLY
85	4.0	0.30	4.0	TREEUNK
428	8.0	0.30	8.0	TREEUNK
508	4.0	0.15	4.0	TREEUNK
509	1.0	0.10	4.0	PALM
568	3.0	0.20	3.0	TREEUNK

JOB NO: CM21738	SCALE: 1:200m @ A3	DRAWN: BP	DATE: May 2022	SHEET: 1 of 1	NOTES:
REVISION:	LEVELLING: OS GPS		PROJECT TITLE: Topographical Survey		All information contained in this drawing (including digital data) should be checked and verified prior to any fabrication or construction.
			SITE ADDRESS: Haydon House, 296 Joel Street, HA5 2PY		

NORTH: indicative

CLIENT: Westgold Developments

Cadmap
Cadmap Ltd
Unit 131 Dunsfold Park
Cranleigh
Surrey, GU6 8TB
T: 01483 429385
E: info@cadmap.co.uk
W: www.cadmap.co.uk



EXISTING SITE PLAN
Scale 1:200

Notes
1. All dimensions to be checked on site.
2. All dimensions are to masonry unless otherwise stated (ie not plaster finishes)
3. All information is to be checked and verified by the contractors and sub-contractors for accuracy and fit.
4. Discrepancies or omissions to be brought to the attention of **CIAO** prior to construction.
5. This drawing has been drawn to scale,as shown, for the purpose of obtaining local authority approval
6. For General Notes refer to Drawing No. 4GN-01

Rev	Date	Notes

Client: Westgold Holdings Ltd	**Stage:** Planning	**Date:** 24/05/2022	
Project: Haydon House, 296 Joel Street, HA5 2PY	**Project Ref. No:** 166	**Scale:** 1:200@A3	
Drawing title: Existing site plan	**Drawing number:** 166-3EX-01	**Drawn By:** FC	**Checked By:** AP

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Notes

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3. All information is to be checked and verified by the contractors and sub-contractors for accuracy and fit.
4. Discrepancies or omissions to be brought to the attention of **CIAO** prior to construction.
5. This drawing has been drawn as scale, as shown, for the purpose of obtaining local authority approval
6. For General Notes refer to Drawing No. 4GN-01

Rev	Date	Notes

Client:	Westgold Holdings Ltd
Project:	Hoydon House, 296 Joel Street, HA3 2PY
Drawing title:	Existing plans
Stage:	Planning
Project Ref. No:	166
Drawing number:	166-3EX-02
Date:	24/05/2022
Scale:	1:100@A2
Drawn By:	FG
Checked By:	AP

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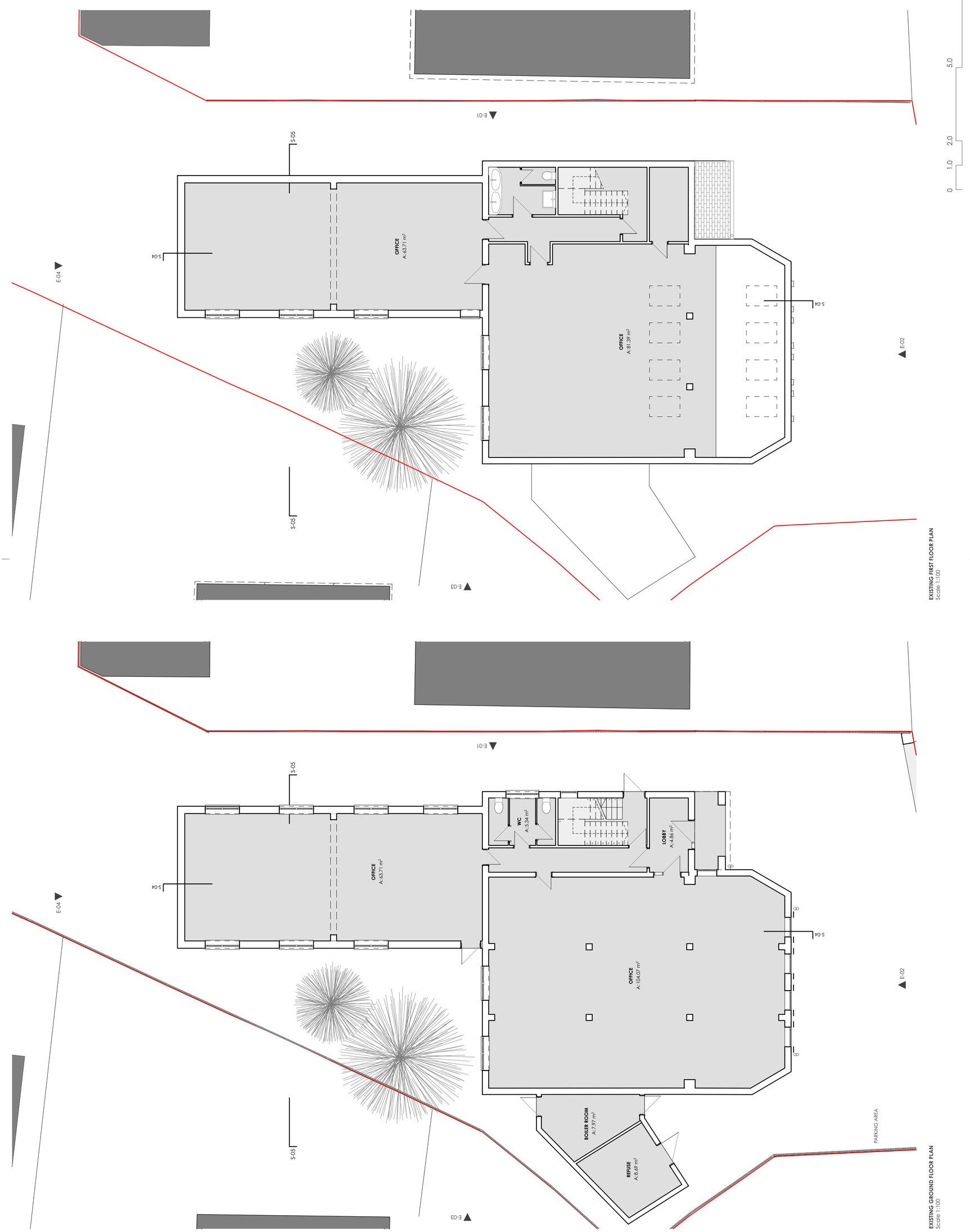
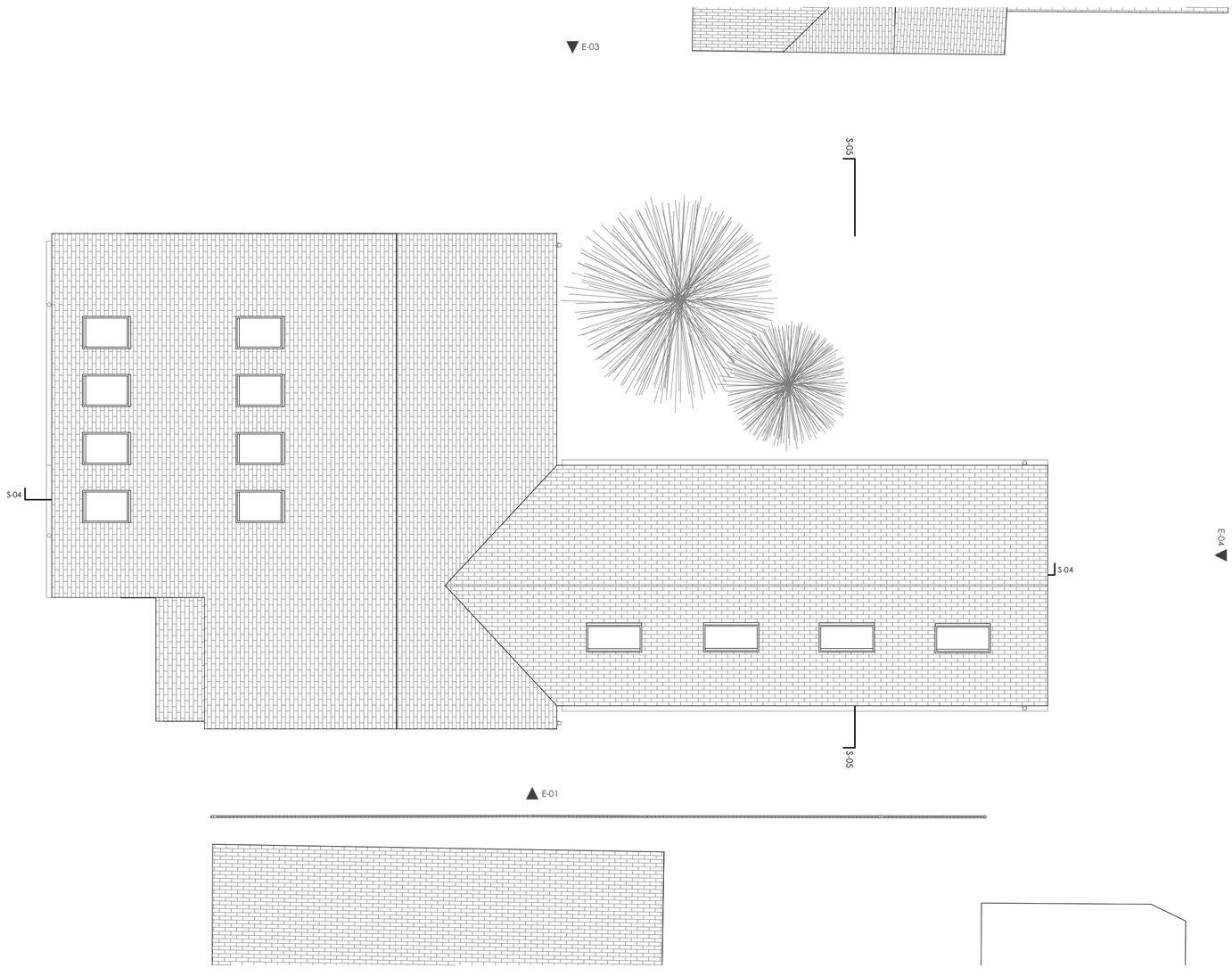


EXISTING FIRST FLOOR PLAN
Scale 1:100

EXISTING GROUND FLOOR PLAN
Scale 1:100

EXISTING ROOF PLAN
Scale 1:100



0 1.0 2.0 5.0 10.0

Notes

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5. This drawing has been drawn to scale, as shown, for the purpose of obtaining local authority approval
6. For General Notes refer to Drawing No. 4GN-01

Rev	Date	Notes

Client: Westgold Holdings Ltd	**Stage:** Planning	**Date:** 24/05/2022	
Project: Haydon House, 296 Joel Street, HA5 2PY	**Project Ref. No:** 166	**Scale:** 1:100@A2	
Drawing title: Existing plan	**Drawing number:** 166-3EX-03	**Drawn By:** FC	**Checked By:** AP

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EXISTING FRONT ELEVATION
Scale 1:100

EXISTING EAST ELEVATION
Scale 1:100

EXISTING S-04 SECTION
Scale 1:100

0 2.0 4.0 10.0 20.0

Notes

1. All dimensions to be checked on site.
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5. This drawing has been drawn to scale, as shown, for the purpose of obtaining local authority approval
6. For General Notes refer to Drawing No. 4GN-01

Rev	Date	Notes

Client: Westgold Holdings Ltd	**Stage:** Planning	**Date:** 24/05/2022	
Project: Haydon House, 296 Joel Street, HA5 2PY	**Project Ref. No:** 166	**Scale:** 1:100@A2	
Drawing title: Existing elevations and section	**Drawing number:** 166-3EX-04	**Drawn By:** FC	**Checked By:** AP

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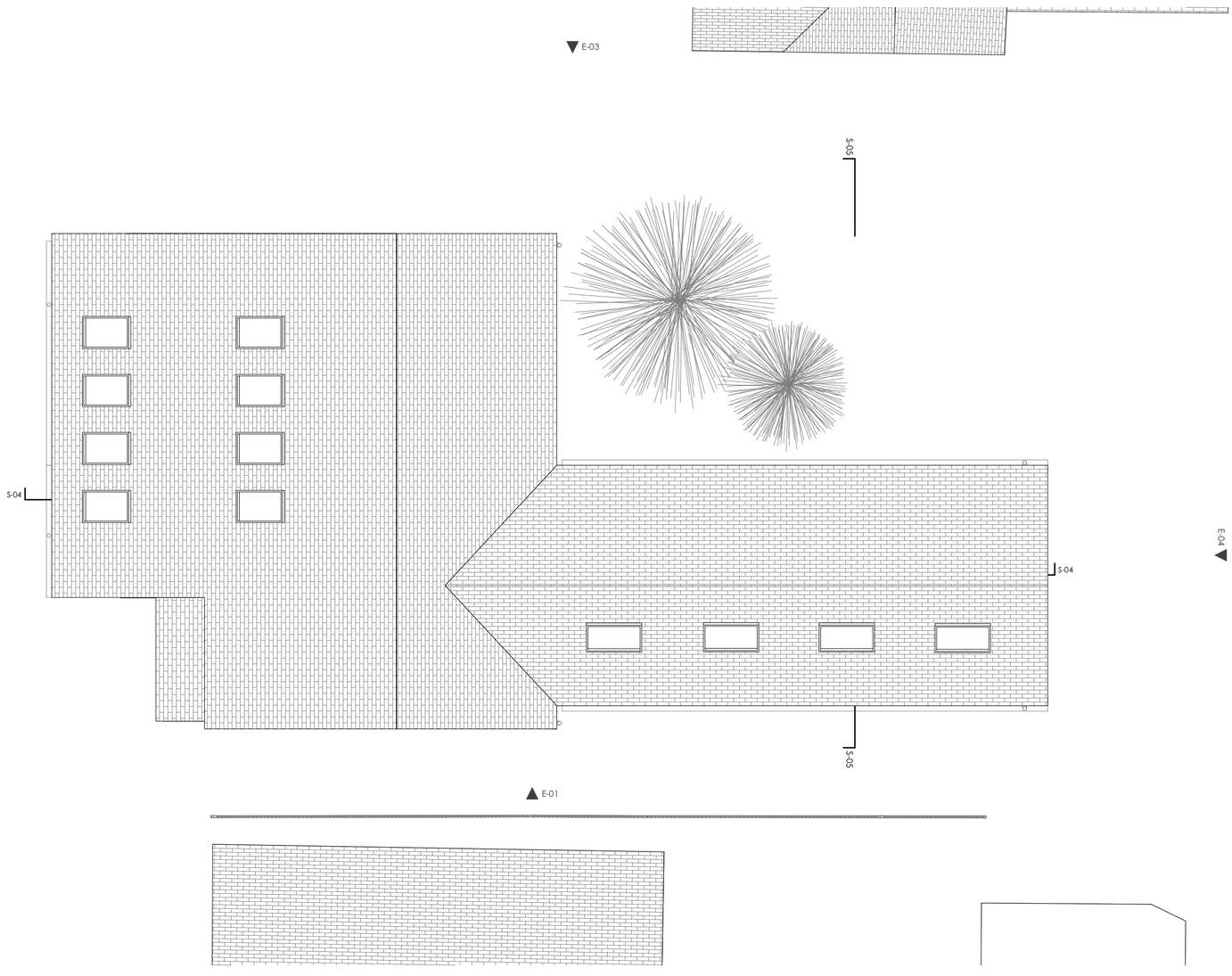
EXISTING ROOF PLAN
Scale 1:100



0 1.0 2.0 5.0 10.0

Notes

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Rev	Date	Notes

Client: Westgold Holdings Ltd	**Stage:** Planning	**Date:** 24/05/2022	
Project: Haydon House, 296 Joel Street, HA5 2PY	**Project Ref. No:** 166	**Scale:** 1:100@A2	
Drawing title: Existing plan	**Drawing number:** 166-3EX-03	**Drawn By:** FC	**Checked By:** AP

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EXISTING FRONT ELEVATION
Scale 1:100

EXISTING EAST ELEVATION
Scale 1:100

EXISTING S-04 SECTION
Scale 1:100

0 2.0 4.0 10.0 20.0

Notes

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4. Discrepancies or omissions to be brought to the attention of **CIAO** prior to construction.
5. This drawing has been drawn to scale, as shown, for the purpose of obtaining local authority approval
6. For General Notes refer to Drawing No. 4GN-01

Rev	Date	Notes

Client: Westgold Holdings Ltd	**Stage:** Planning	**Date:** 24/05/2022	
Project: Haydon House, 296 Joel Street, HA5 2PY	**Project Ref. No:** 166	**Scale:** 1:100@A2	
Drawing title: Existing elevations and section	**Drawing number:** 166-3EX-04	**Drawn By:** FC	**Checked By:** AP

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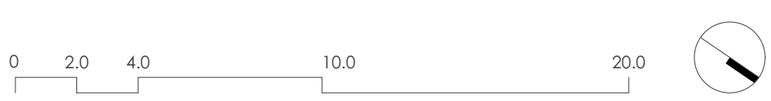
EXISTING REAR ELEVATION
Scale 1:100

EXISTING WEST ELEVATION
Scale 1:100

EXISTING S-05 SECTION
Scale 1:100



Notes

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5. This drawing has been drawn to scale, as shown, for the purpose of obtaining local authority approval
6. For General Notes refer to Drawing No. 4GN-01

Rev	Date	Notes

Client: Westgold Holdings Ltd	**Stage:** Planning	**Date:** 24/05/2022	
Project: Haydon House, 296 Joel Street, HA5 2PY	**Project Ref. No:** 166	**Scale:** 1:100@A2	
Drawing title: Existing elevations and section	**Drawing number:** 166-3EX-05	**Drawn By:** FC	**Checked By:** AP

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PROPOSED SITE PLAN
Scale 1:200

Notes
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4. Discrepancies or omissions to be brought to the attention of **CIAO** prior to construction.
5. This drawing has been drawn to scale,as shown, for the purpose of obtaining local authority approval
6. For General Notes refer to Drawing No. 4GN-01

Rev	Date	Notes

Client: Westgold Holdings Ltd	**Stage:** Planning	**Date:** 24/05/2022	
Project: Haydon House, 296 Joel Street, HA5 2PY	**Project Ref. No:** 166	**Scale:** 1:200@A3	
Drawing title: Proposed site plan	**Drawing number:** 166-3GA-01	**Drawn By:** FC	**Checked By:** AP

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PROPOSED GROUND FLOOR PLAN
Scale 1:100

PROPOSED FIRST FLOOR PLAN
Scale 1:100

KEY

- 2 bedroom 3 people flat
- 1 person studio
- 1 bedroom 2 people flat

0 1.0 2.0 5.0 10.0

Notes

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2. All dimensions are to masonry unless otherwise stated (ie not plaster finished)
3. All dimensions to be checked and verified by the contractors for accuracy and fit.
4. Discrepancies or omissions to be brought to the attention of **CIAO** prior to construction.
5. This drawing has been drawn to scale, as shown, for the purpose of obtaining local authority approval
6. For compliance refer to Drawing No. 204.01

Rev	Date	Notes

Client: Westgold Holdings Ltd

Project: Haydon House, 296 Joel Street HA5 2PY

Drawing title: Proposed 1st & 2nd floor plan

Stage: Planning

Project Ref. No: 166

Drawing number: 166-204.02

Date: 24/05/2022

Scale: 1:100@A2

Drawn By: FC

Checked By: AP

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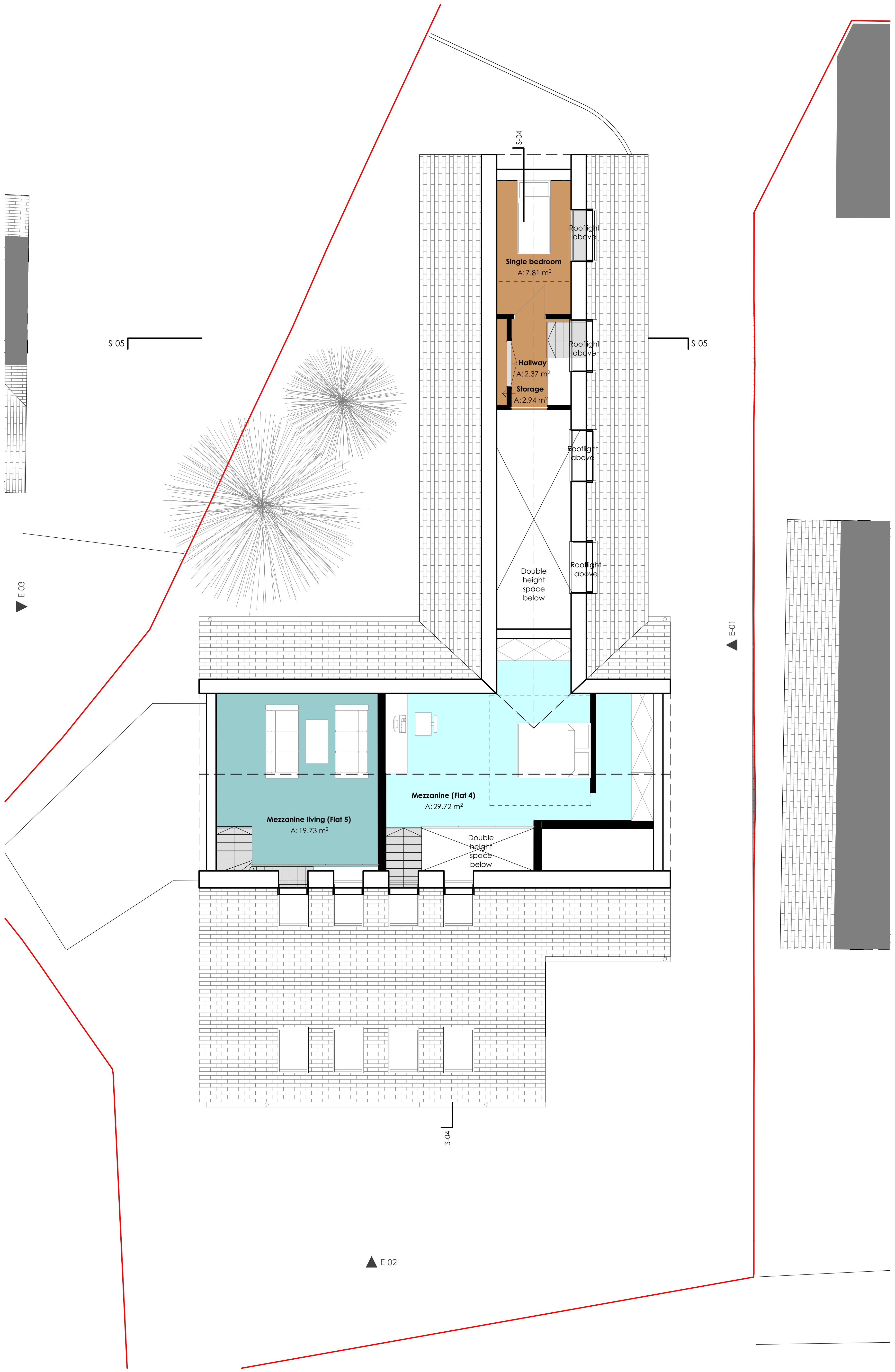
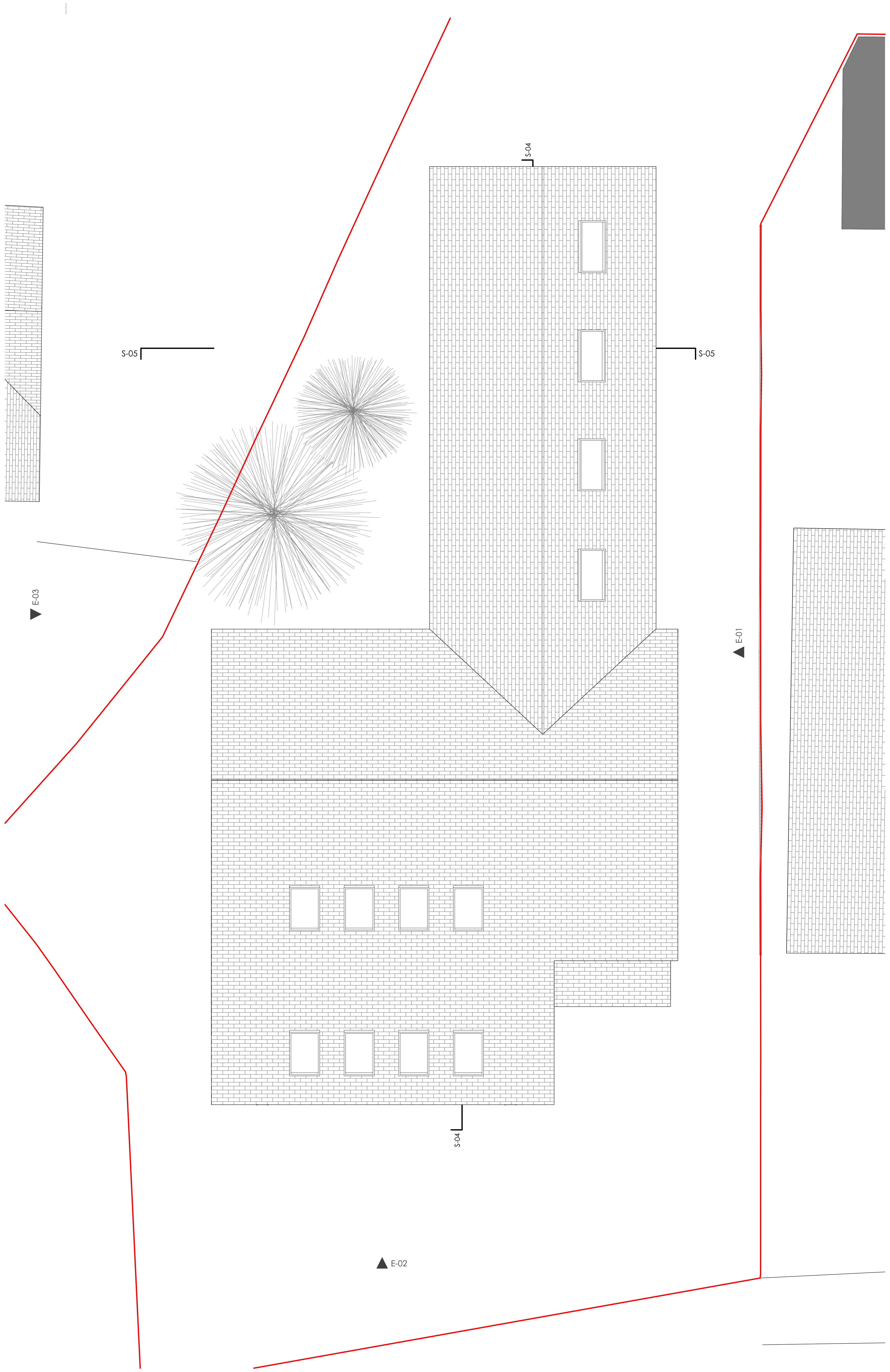


PROPOSED LOFT PLAN
Scale 1:100



PROPOSED ROOF PLAN
Scale 1:100

0 1.0 2.0 5.0 10.0

Notes

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6. For General Notes refer to Drawing No. 4GN-01

Rev	Date	Notes

Client: Westgold Holdings Ltd	**Stage:** Planning	**Date:** 24/05/2022
Project: Haydon House, 296 Joel Street, HA5 2PY	**Project Ref. No:** 166	**Scale:** 1:100@A2
Drawing title: Proposed loft & roof plan	**Drawing number:** 166-3GA-03	**Drawn By:** FC
		Checked By: AP

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PROPOSED REAR ELEVATION
Scale 1:100

PROPOSED WEST ELEVATION
Scale 1:100

PROPOSED S-05 SECTION
Scale 1:100

0 2.0 4.0 10.0 20.0

Notes

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5. This drawing has been drawn to scale, as shown, for the purpose of obtaining local authority approval
6. For General Notes refer to Drawing No. 4GN-01

Rev	Date	Notes

Client: Westgold Holdings Ltd	**Stage:** Planning	**Date:** 24/05/2022	
Project: Haydon House, 296 Joel Street, HA5 2PY	**Project Ref. No:** 166	**Scale:** 1:100@A2	
Drawing title: Proposed elevations and section	**Drawing number:** 166-3GA-05	**Drawn By:** FC	**Checked By:** AP

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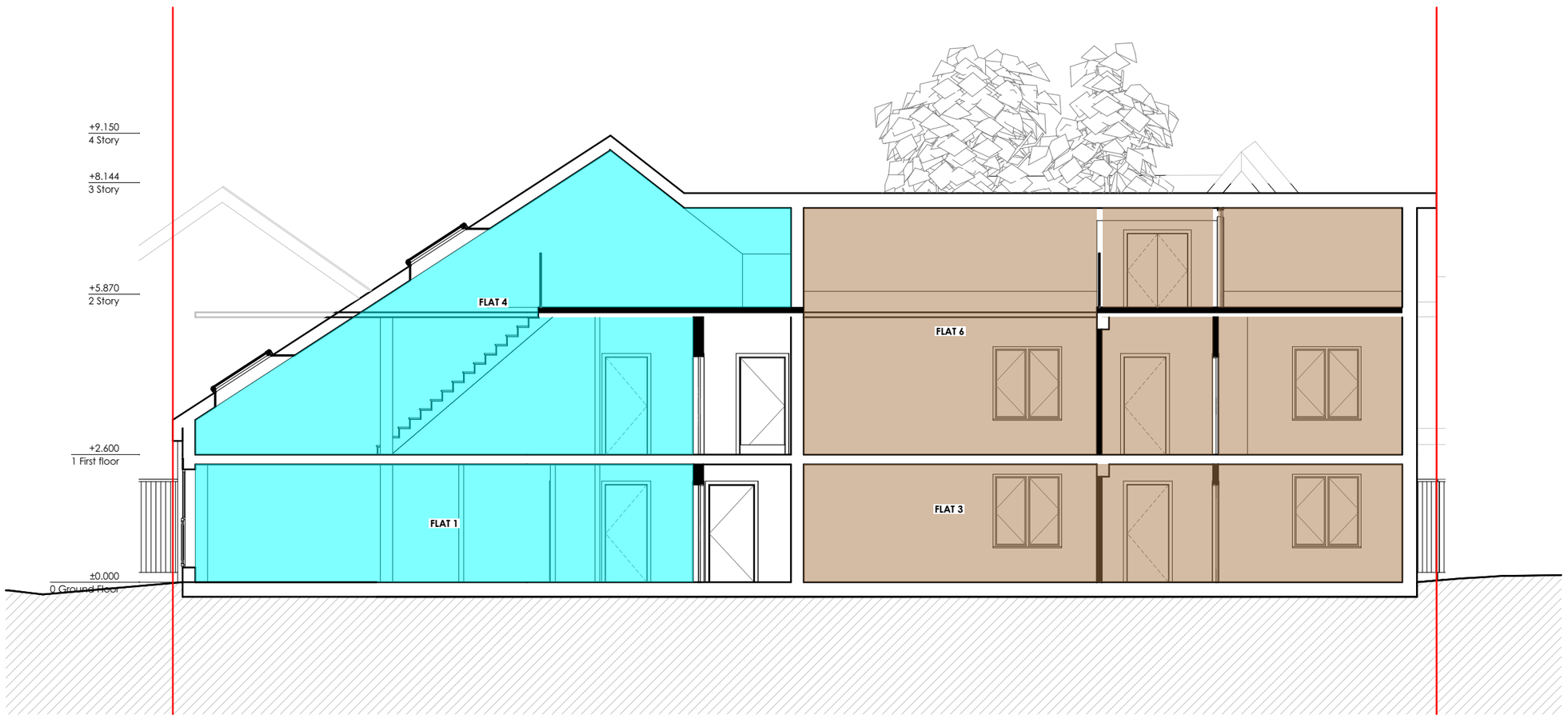
PROPOSED FRONT ELEVATION
Scale 1:100

PROPOSED EAST ELEVATION
Scale 1:100



PROPOSED S-04 SECTION
Scale 1:100

0 2.0 4.0 10.0 20.0

Notes

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6. For General Notes refer to Drawing No. 4GN-01

Rev	Date	Notes

Client: Westgold Holdings Ltd	**Stage:** Planning	**Date:** 24/05/2022	
Project: Haydon House, 296 Joel Street, HA5 2PY	**Project Ref. No:** 166	**Scale:** 1:100@A2	
Drawing title: Proposed Section S-04 and east elevation	**Drawing number:** 166-3GA-04	**Drawn By:** FC	**Checked By:** AP

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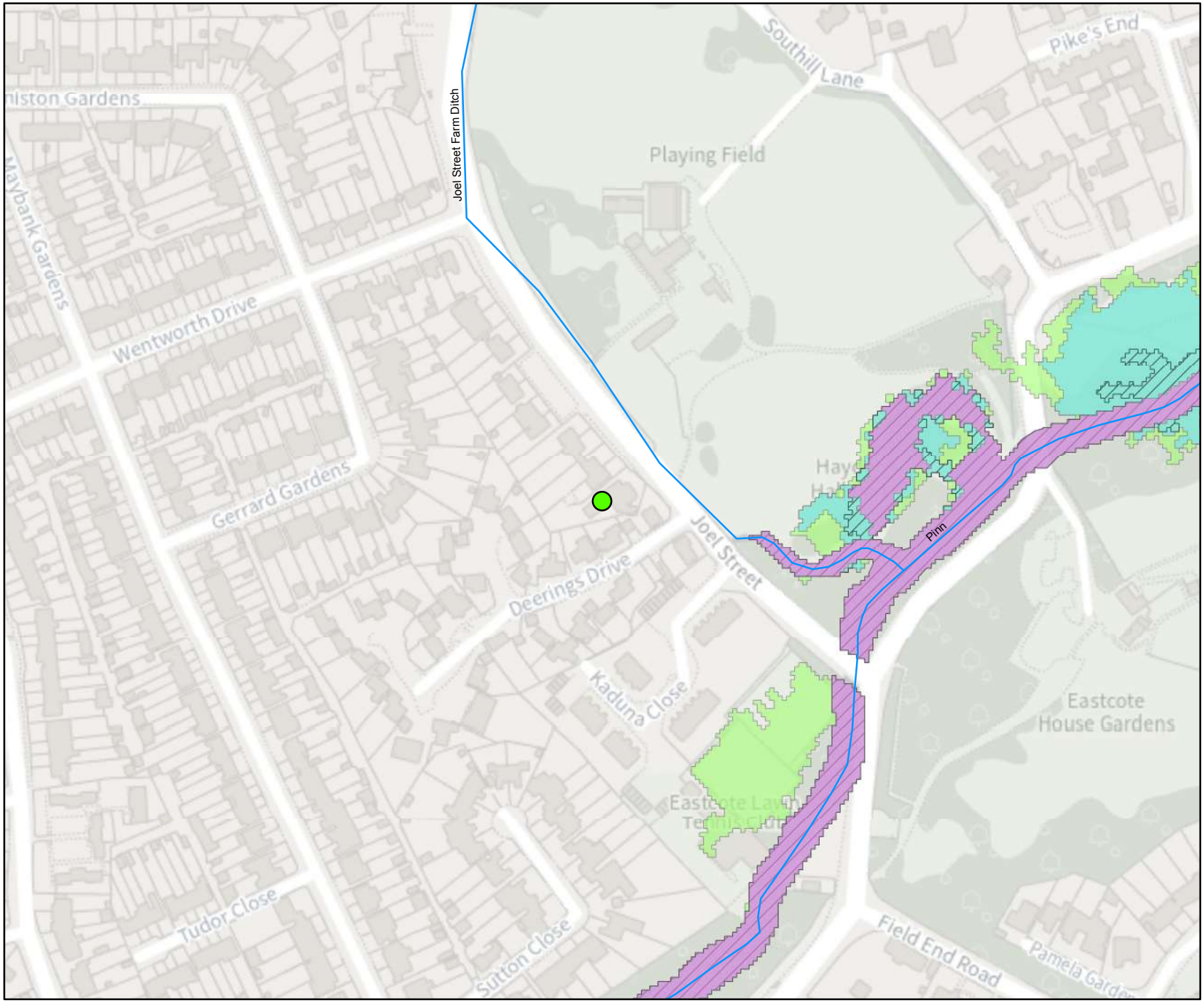
Appendix A.2 – Environment Agency Flood Report

Detailed FRA centred on: Haydon House, 296 Joel Street, HA5 2PY - 14/04/2022 - HNL 258175 HH



Environment Agency
Alchemy,
Bessemer Road,
Welwyn Garden City,
Hertfordshire,
AL7 1HE

N

0 37.5 75 150

Metres

Legend

- Main Rivers
- Site location

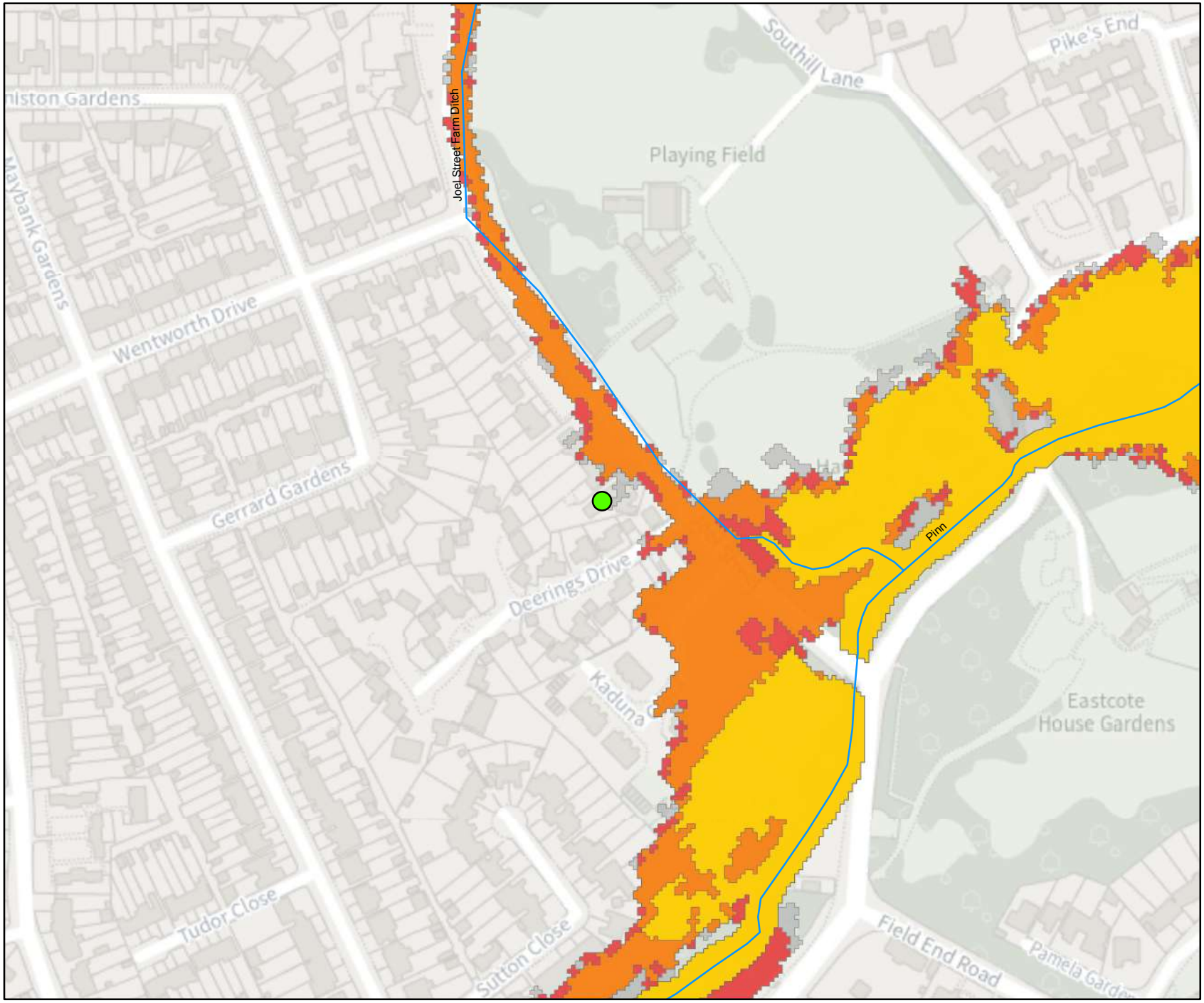
Defended Flood Outlines

- 1 in 2 year (50%) Defended
- 1 in 5 year (20%) Defended
- 1 in 10 year (10%) Defended
- 1 in 20 year (5%) Defended

The data in this map has been extracted from the River Pinn Mapping Study (JBA, 2015).
This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment.
Modelled outlines take into account catchment wide defences.
Flood risk data requests including an allowance for climate change will be based on the 1 in 100 flood plus 20% allowance for climate change, unless otherwise stated. You should refer to 'Flood risk assessments: climate change allowances' to check if this allowance is still appropriate for the type of development you are proposing and its location. You may need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.
https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London

Detailed FRA centred on: Haydon House, 296 Joel Street, HA5 2PY - 14/04/2022 - HNL 258175 HH



Environment Agency
Alchemy,
Bessemer Road,
Welwyn Garden City,
Hertfordshire,
AL7 1HE

N

0 37.5 75 150
Metres

Legend

- Main Rivers
- Site location

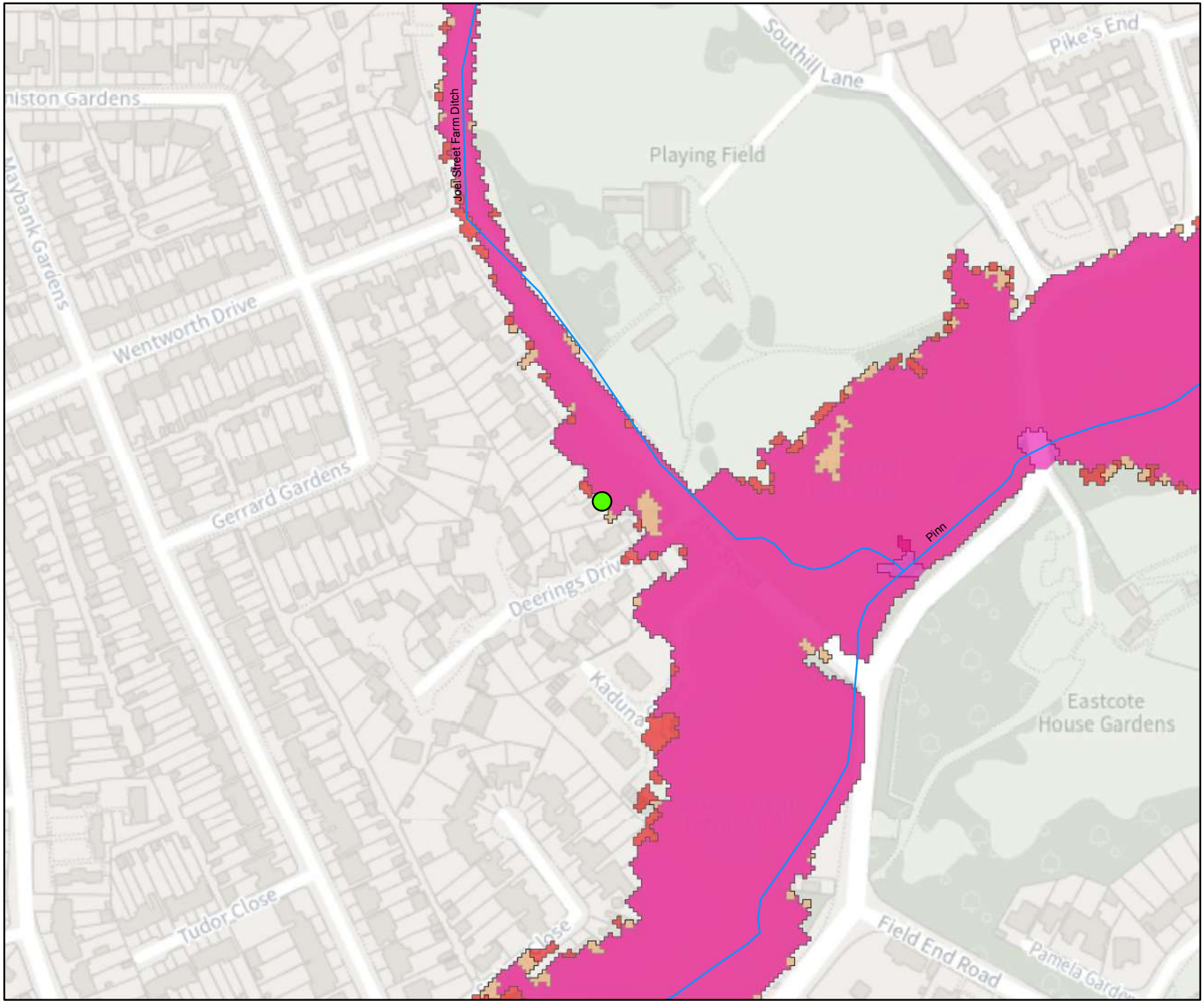
Defended Flood Outlines

- 1 in 30 year (3.33%) Defended
- 1 in 50 year (2%) Defended
- 1 in 75 year (1.33%) Defended
- 1 in 100 year (1%) Defended

The data in this map has been extracted from the River Pinn Mapping Study (JBA, 2015).
This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment.
Modelled outlines take into account catchment wide defences.
Flood risk data requests including an allowance for climate change will be based on the 1 in 100 flood plus 20% allowance for climate change, unless otherwise stated. You should refer to 'Flood risk assessments: climate change allowances' to check if this allowance is still appropriate for the type of development you are proposing and its location. You may need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.
https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London

Detailed FRA centred on: Haydon House, 296 Joel Street, HA5 2PY - 14/04/2022 - HNL 258175 HH



Environment Agency
Alchemy,
Bessemer Road,
Welwyn Garden City,
Hertfordshire,
AL7 1HE

N

0 37.5 75 150
Metres

Legend

- Main Rivers
- Site location

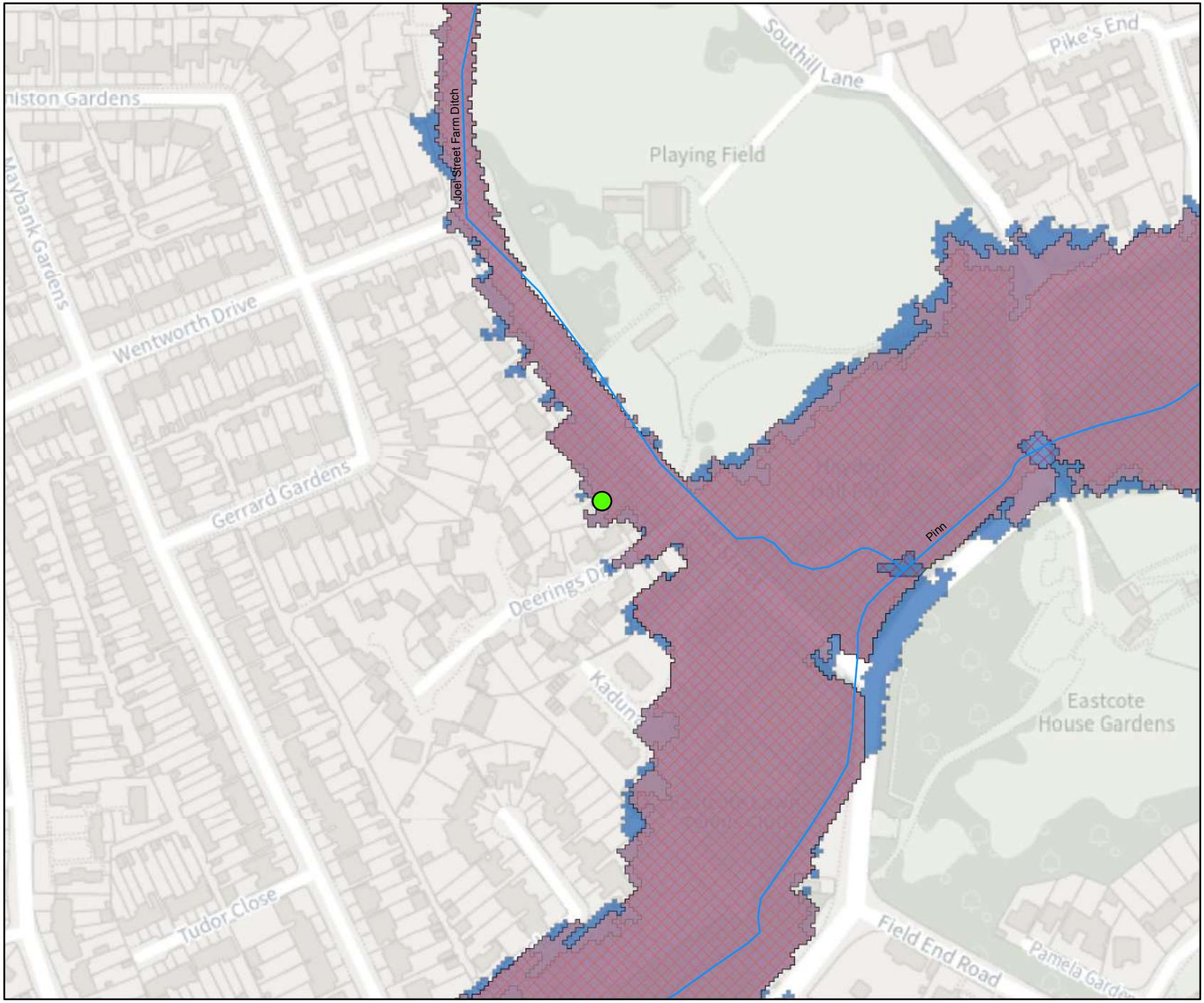
Defended Flood Outlines

- 1 in 100 year + 20% (*CC) Defended
- 1 in 100 year + 25% (*CC) Defended
- 1 in 100 year + 35% (*CC) Defended

The data in this map has been extracted from the River Pinn Mapping Study (JBA, 2015).
This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment.
Modelled outlines take into account catchment wide defences.
Flood risk data requests including an allowance for climate change will be based on the 1 in 100 flood plus 20% allowance for climate change, unless otherwise stated. You should refer to 'Flood risk assessments: climate change allowances' to check if this allowance is still appropriate for the type of development you are proposing and its location. You may need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.
https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London

Detailed FRA centred on: Haydon House, 296 Joel Street, HA5 2PY - 14/04/2022 - HNL 258175 HH



Environment Agency
Alchemy,
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Welwyn Garden City,
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AL7 1HE

N

0 37.5 75 150
Metres

Legend

- Main Rivers
- Site location

Defended Flood Outlines

- 1 in 100 year + 70% (*CC) Defended
- 1 in 250 year (0.4%) Defended
- 1 in 1000 year (0.1%) Defended

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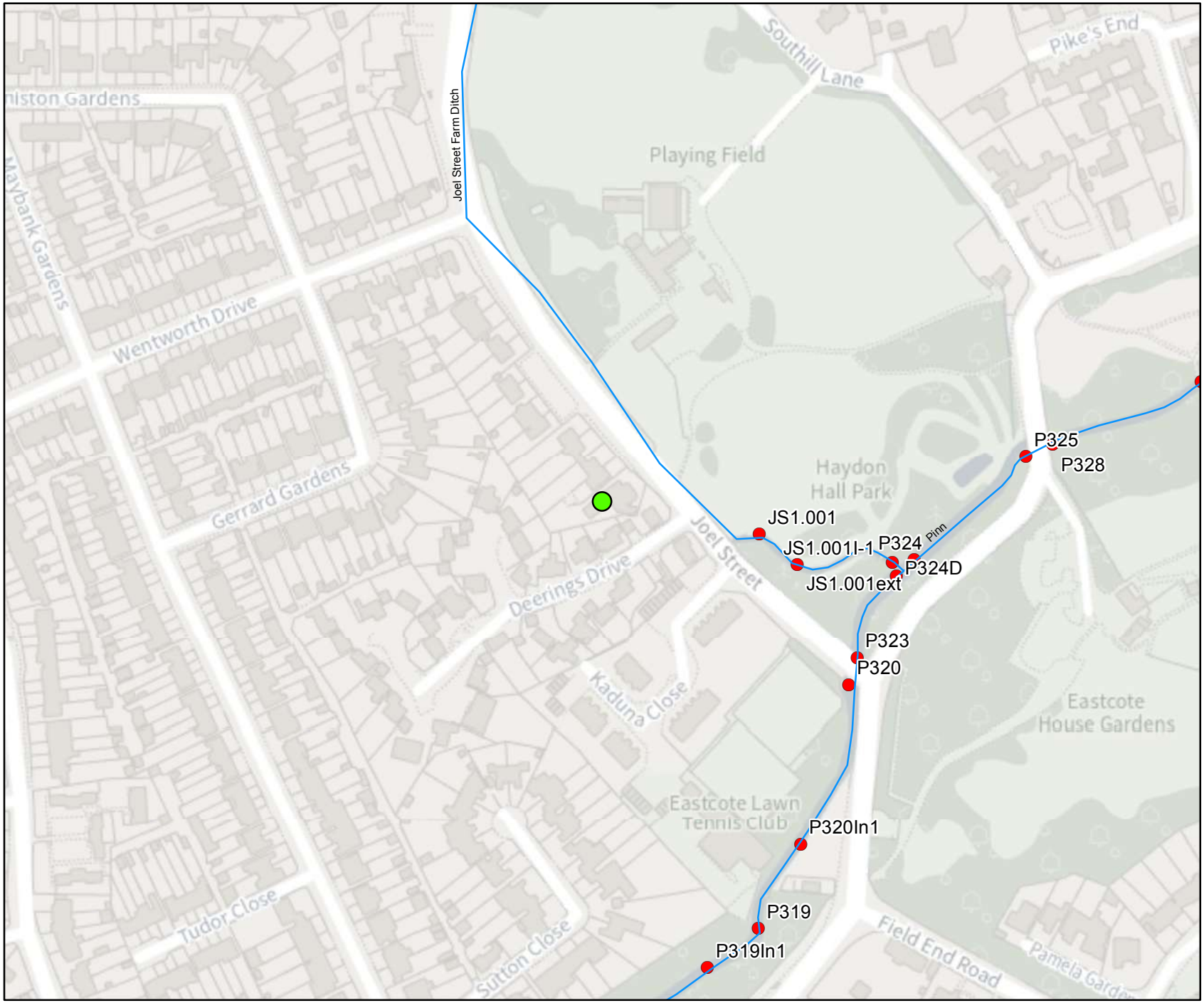

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0 37.5 75 150
Metres

Legend

- Main Rivers
- Site location

1D Node Results

- Nodes

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Environment Agency ref: HNL 258175 HH

The following information has been extracted from the River Pinn Mapping Study (JBA, 2015)

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Caution:
This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites across the entire catchment.

All flood levels are given in metres Above Ordnance Datum (mAOD)
All flows are given in cubic metres per second (cumecs)

MODELLED FLOOD LEVEL

				Return Period												
Node Label	**Easting**	**Northing**	**2 yr**	**5 yr**	**10 yr**	**20 yr**	**30 yr**	**50 yr**	**75 yr**	**100 yr**	**100yr + 20%**	**100yr + 25%**	**100yr + 35%**	**100yr + 70%**	**250 yr**	**1000yr**
P328	510695	188858	43.13	43.38	43.50	43.62	43.72	43.83	43.92	43.98	44.08	44.10	44.15	44.29	44.14	44.41
P325	510682	188852	43.11	43.36	43.47	43.58	43.67	43.78	43.86	43.91	44.01	44.03	44.08	44.23	44.07	44.35
P324	510628	188802	43.07	43.32	43.44	43.55	43.65	43.76	43.84	43.89	43.98	44.00	44.05	44.20	44.04	44.33
P324D	510619	188794	43.07	43.32	43.44	43.55	43.65	43.76	43.84	43.89	43.98	44.00	44.05	44.20	44.04	44.33
P323	510600	188755	42.98	43.24	43.35	43.47	43.57	43.68	43.76	43.81	43.89	43.90	43.94	44.07	43.93	44.21
P320	510596	188742	42.98	43.23	43.34	43.46	43.56	43.66	43.74	43.78	43.85	43.87	43.90	44.01	43.89	44.13
P320In1	510573	188665	42.86	43.10	43.22	43.34	43.43	43.54	43.63	43.68	43.76	43.78	43.81	43.92	43.80	44.03
P319	510553	188624	42.76	43.00	43.12	43.24	43.33	43.43	43.51	43.58	43.68	43.70	43.75	43.87	43.74	43.98
P319In1	510528	188605	42.68	42.94	43.05	43.16	43.26	43.36	43.44	43.51	43.64	43.66	43.71	43.85	43.70	43.95
JS1.001	510553	188814	43.19	43.38	43.48	43.60	43.68	43.79	43.86	43.91	44.00	44.02	44.07	44.21	44.06	44.34
JS1.001I-1	510571	188800	43.10	43.34	43.46	43.58	43.67	43.78	43.86	43.91	44.01	44.03	44.07	44.22	44.07	44.34
JS1.001ext	510617	188801	43.07	43.32	43.44	43.55	43.65	43.76	43.84	43.89	43.98	44.00	44.05	44.20	44.04	44.33

MODELLED FLOWS

				Return Period												
Node Label	**Easting**	**Northing**	**2 yr**	**5 yr**	**10 yr**	**20 yr**	**30 yr**	**50 yr**	**75 yr**	**100 yr**	**100yr + 20%**	**100yr + 25%**	**100yr + 35%**	**100yr + 70%**	**250 yr**	**1000yr**
P328	510695	188858	3.94	5.18	5.86	6.61	7.22	7.88	8.15	8.31	8.53	8.54	8.55	8.67	8.54	8.68
P325	510682	188852	3.94	5.18	5.86	6.61	7.22	7.88	8.15	8.31	8.53	8.54	8.55	8.67	8.54	8.68
P324	510628	188802	3.96	5.04	5.53	6.02	6.48	7.04	7.52	7.98	8.89	9.11	9.42	9.86	9.38	9.96
P324D	510619	188794	4.89	6.53	7.36	8.32	8.94	9.96	10.69	11.50	13.06	13.35	13.82	14.24	13.76	14.16
P323	510600	188755	4.89	6.53	7.36	8.32	8.94	9.96	10.70	11.55	13.43	13.86	14.78	17.36	14.63	18.57
P320	510596	188742	4.89	6.53	7.36	8.32	8.94	9.96	10.70	11.55	13.43	13.86	14.78	17.36	14.63	18.57
P320In1	510573	188665	4.89	6.53	7.36	8.21	8.89	9.65	9.84	10.22	11.24	11.46	12.00	13.93	11.91	15.98
P319	510553	188624	4.89	6.53	7.36	8.21	8.93	9.80	10.07	10.40	10.78	10.81	10.99	12.03	10.95	14.01
P319In1	510528	188605	4.89	6.52	7.36	8.21	8.93	9.80	9.99	10.12	10.25	10.28	10.36	10.89	10.32	12.88
JS1.001	510553	188814	1.28	1.74	2.12	2.52	2.74	2.83	2.86	2.88	2.93	2.94	2.96	3.02	2.95	3.05
JS1.001I-1	510571	188800	1.27	1.74	2.11	2.50	2.74	2.85	2.96	3.08	3.35	3.41	3.54	3.85	3.46	3.98
JS1.001ext	510617	188801	1.27	1.72	2.13	2.62	2.91	3.22	3.47	3.71	4.22	4.28	4.42	4.72	4.39	4.87

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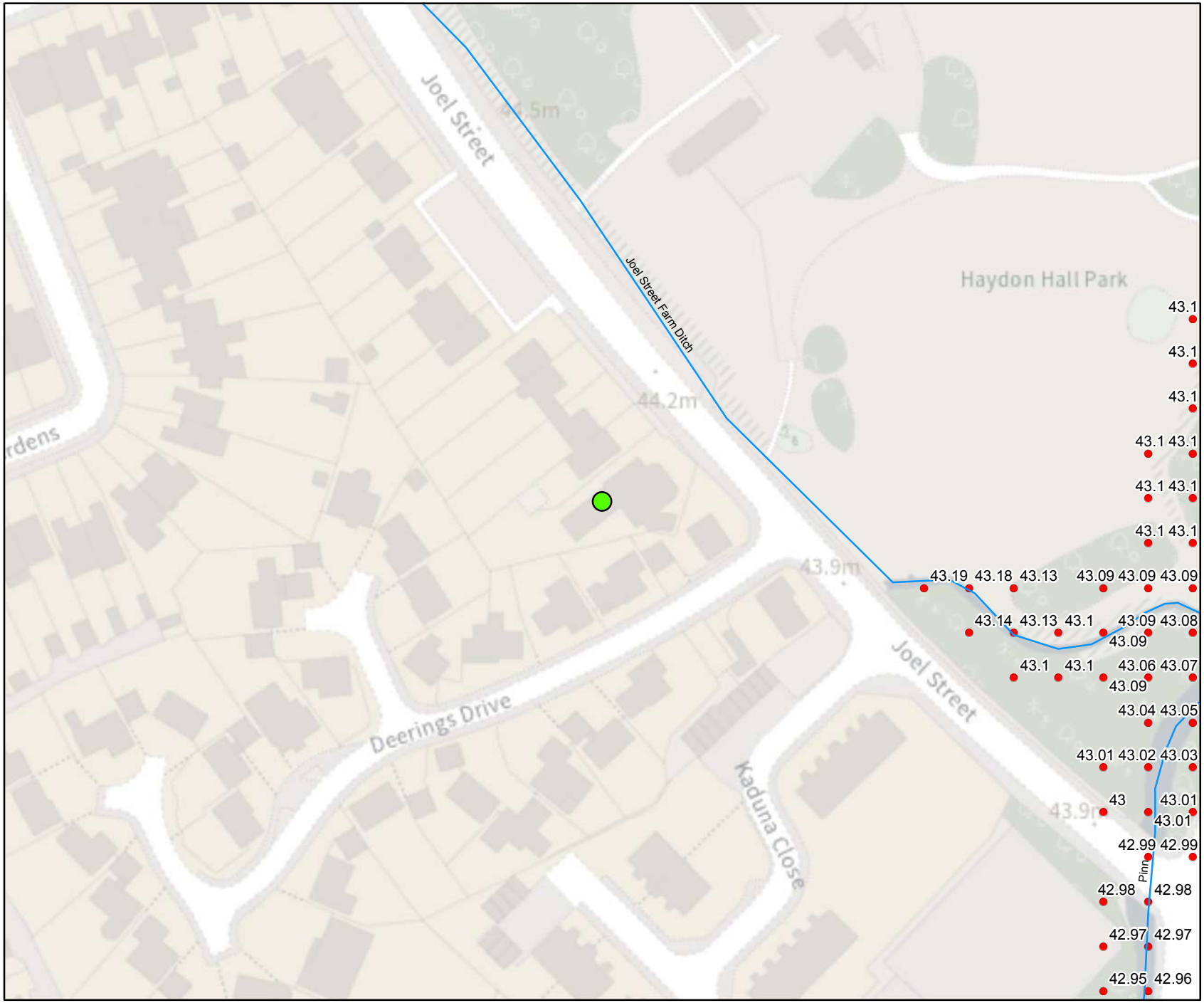

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Alchemy,
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AL7 1HE

N

0 15 30 60
Metres

Legend

Main Rivers

Site location

2D Node Results: Heights

1 in 2 year (50%) Defended

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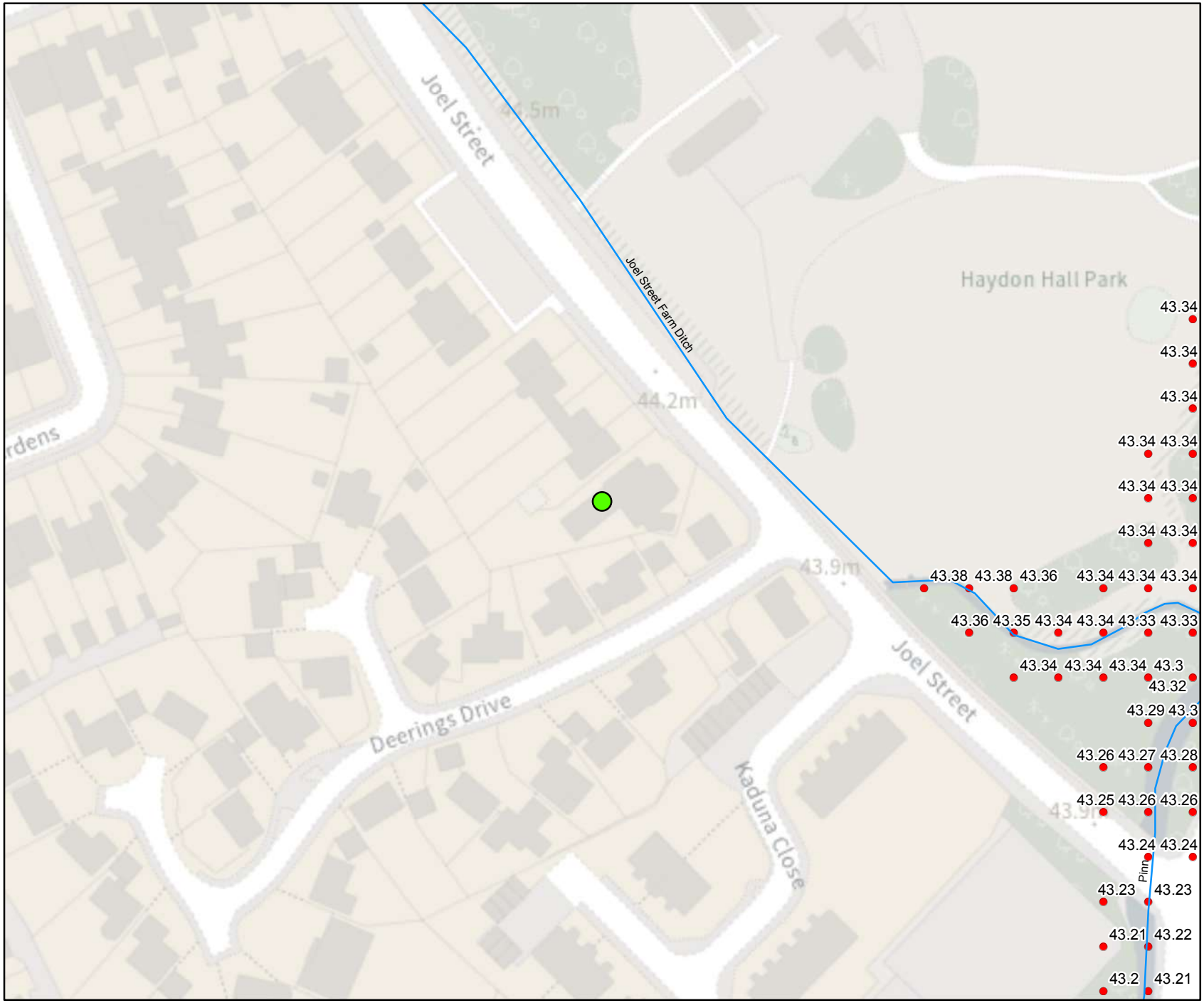

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0 15 30 60
Metres

Legend

Main Rivers

Site location

2D Node Results: Heights

1 in 5 year (20%) Defended

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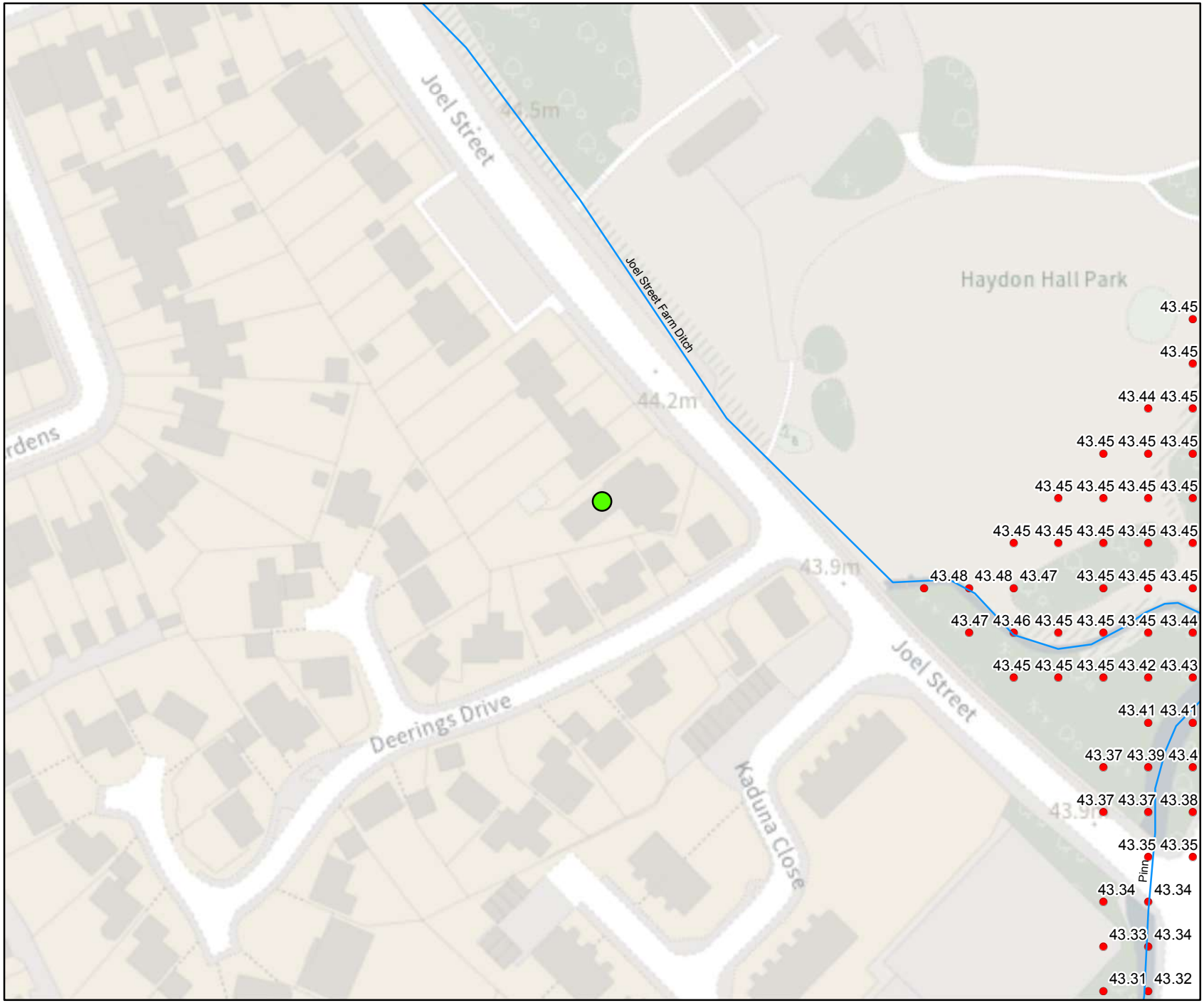

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0 15 30 60
Metres

Legend

Main Rivers

Site location

2D Node Results: Heights

1 in 10 year (10%) Defended

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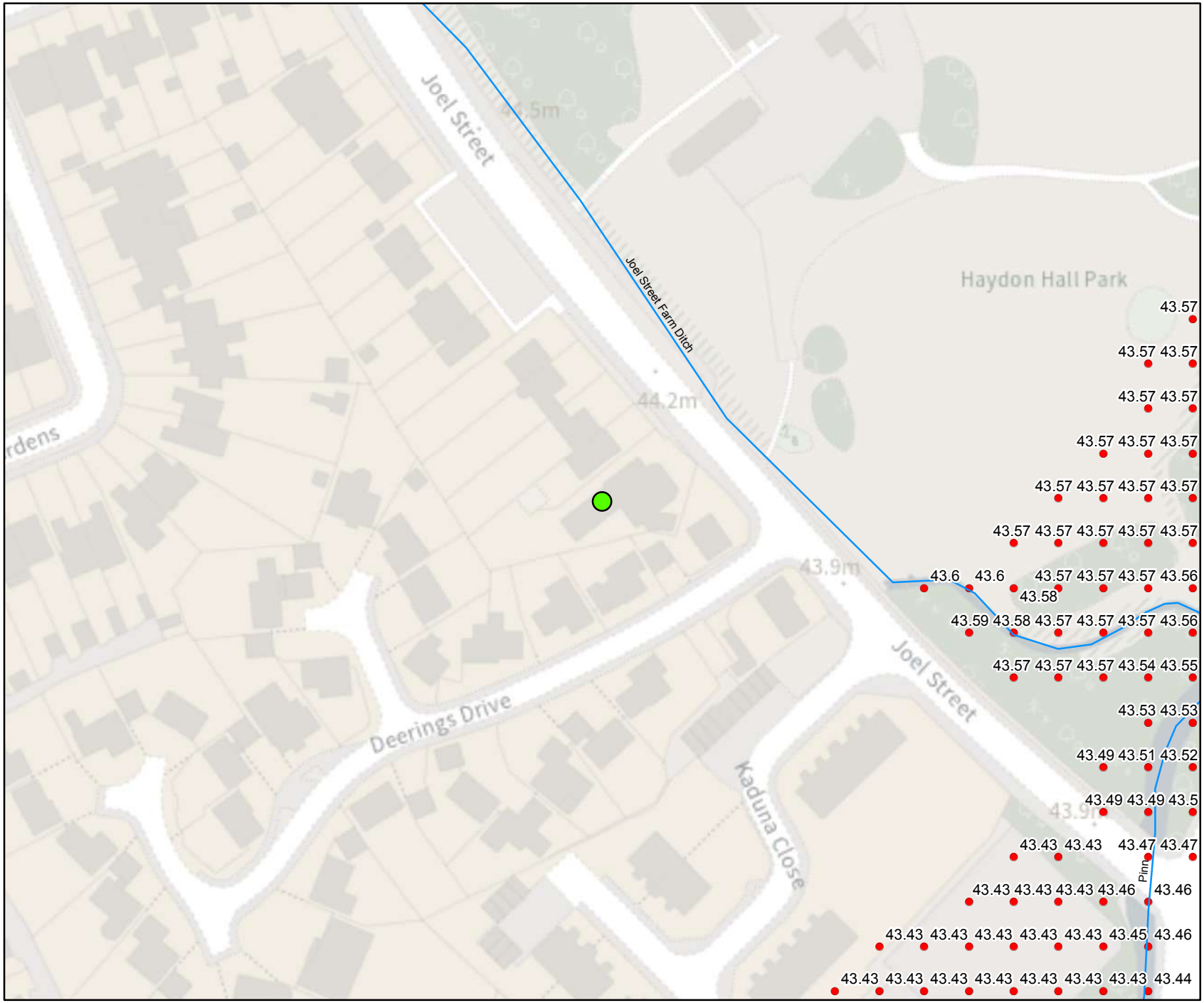

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N

0 15 30 60

Metres

Legend

Main Rivers

Site location

2D Node Results: Heights

1 in 20 year (5%) Defended

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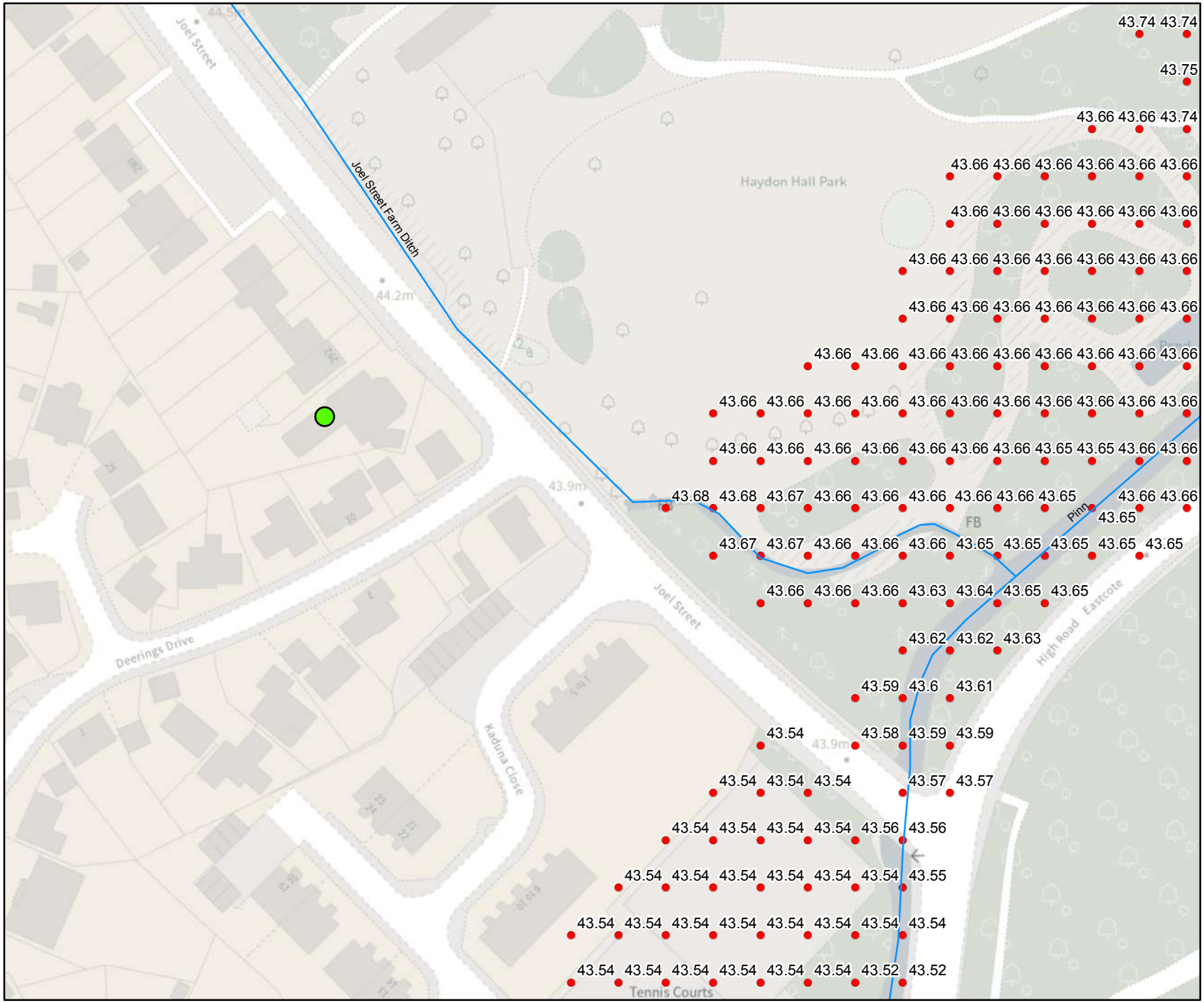

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Metres

Legend

- Main Rivers
- Site location

2D Node Results: Heights

- 1 in 30 year (3.33%) Defended

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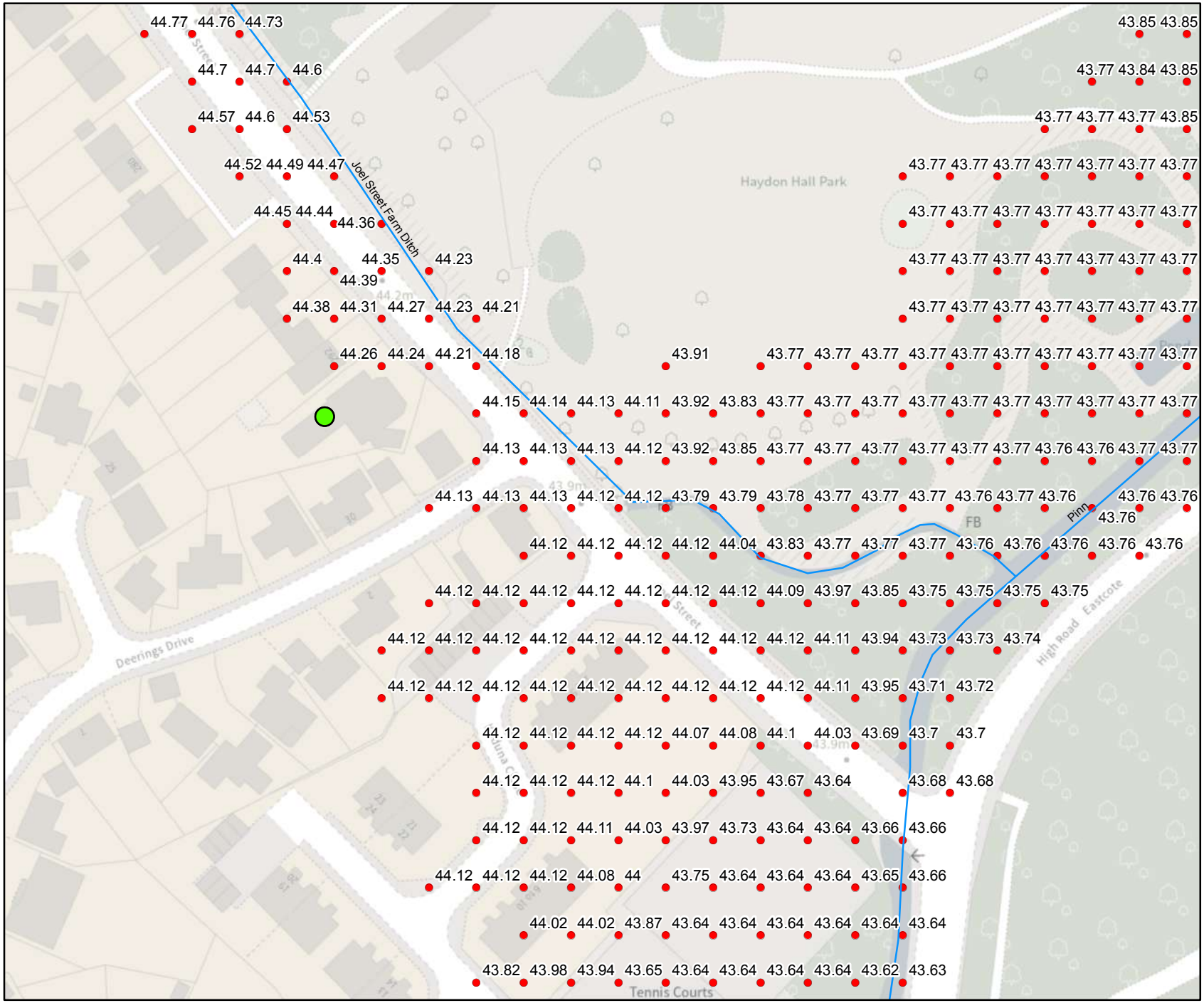

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Metres

Legend

Main Rivers

Site location

2D Node Results: Heights

1 in 50 year (2%) Defended

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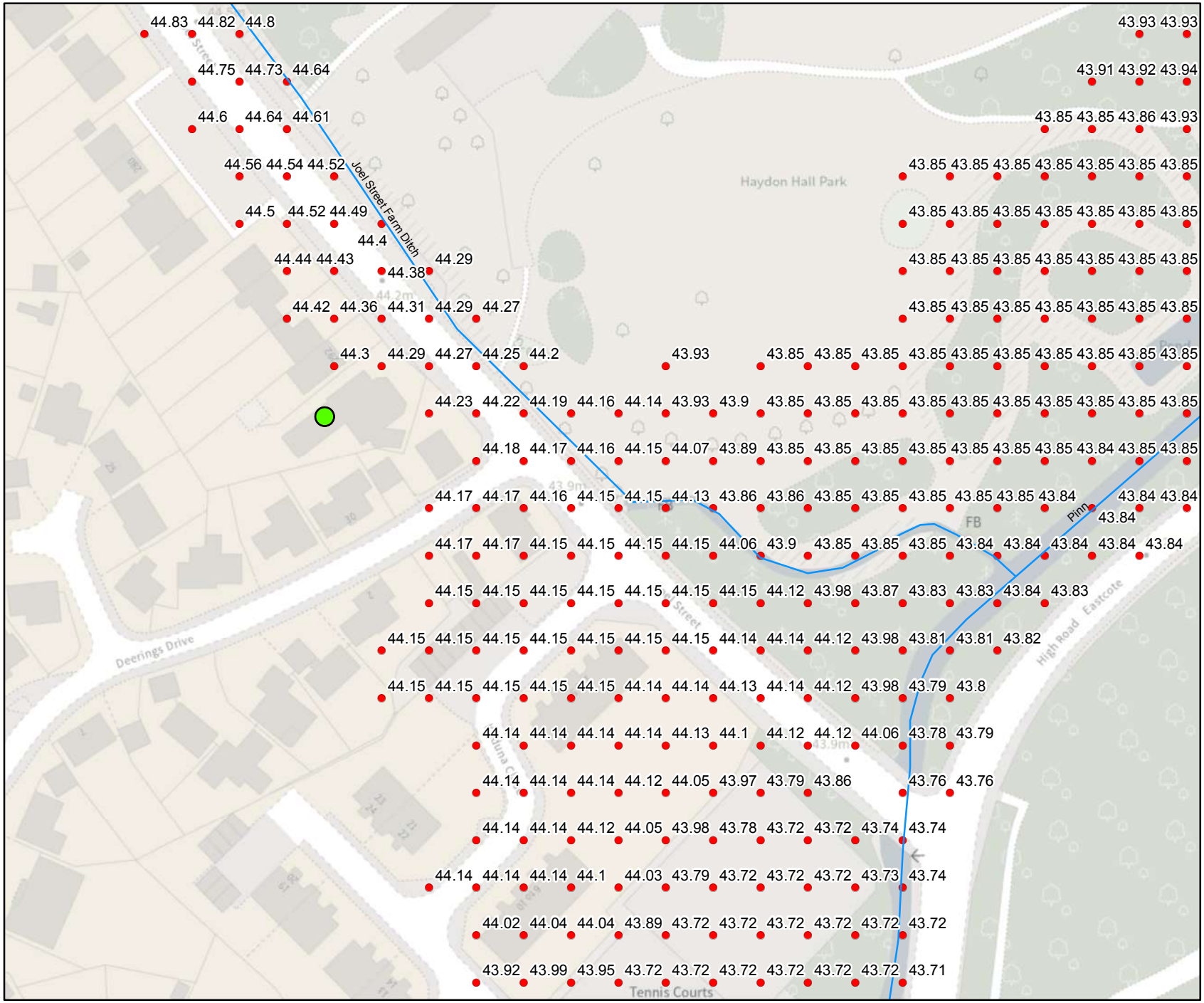

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Metres

Legend

- Main Rivers
- Site location

2D Node Results: Heights

- 1 in 75 year (1.33%) Defended

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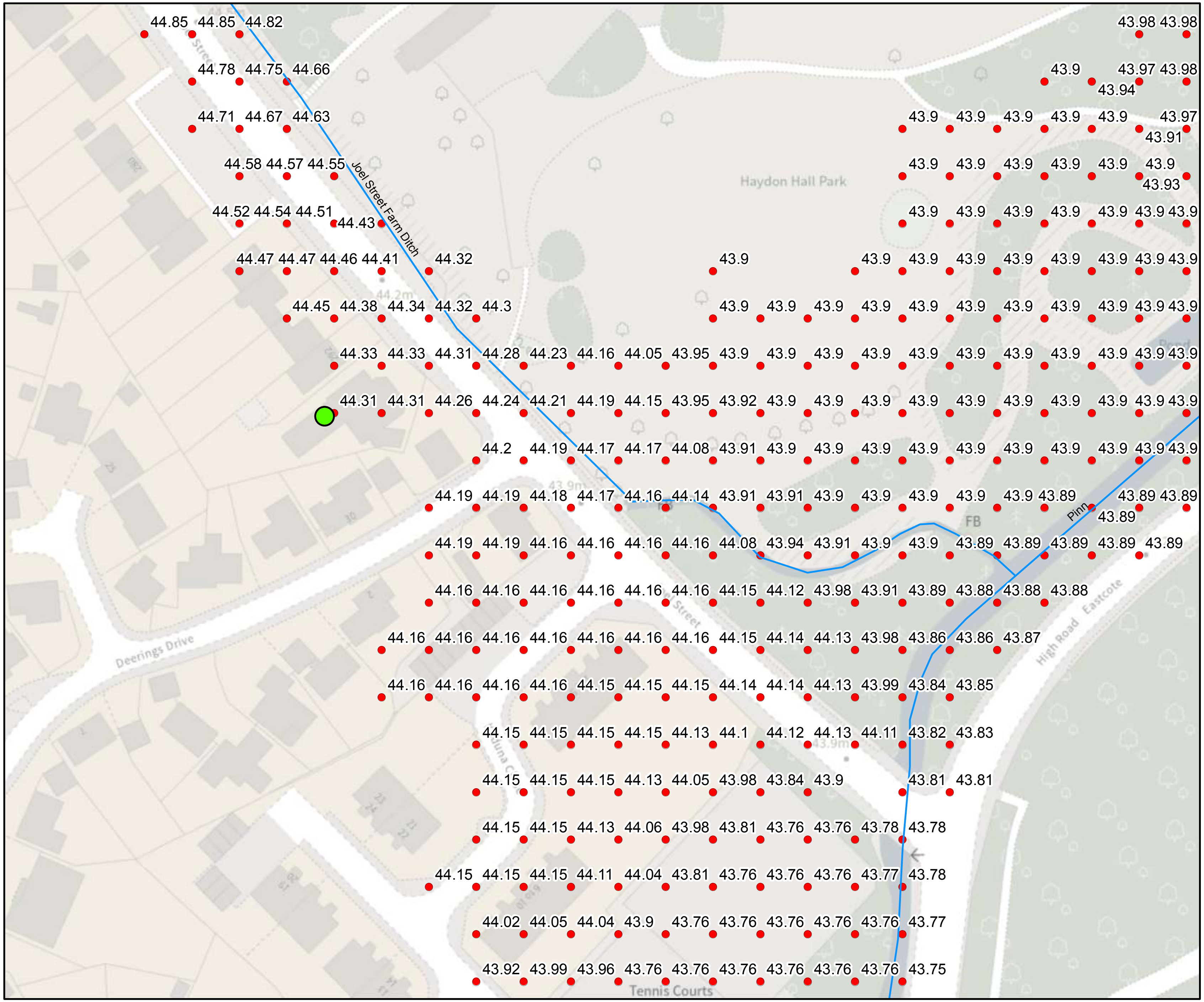

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Metres

Legend

Main Rivers

Site location

2D Node Results: Heights

1 in 100 year (1%) Defended

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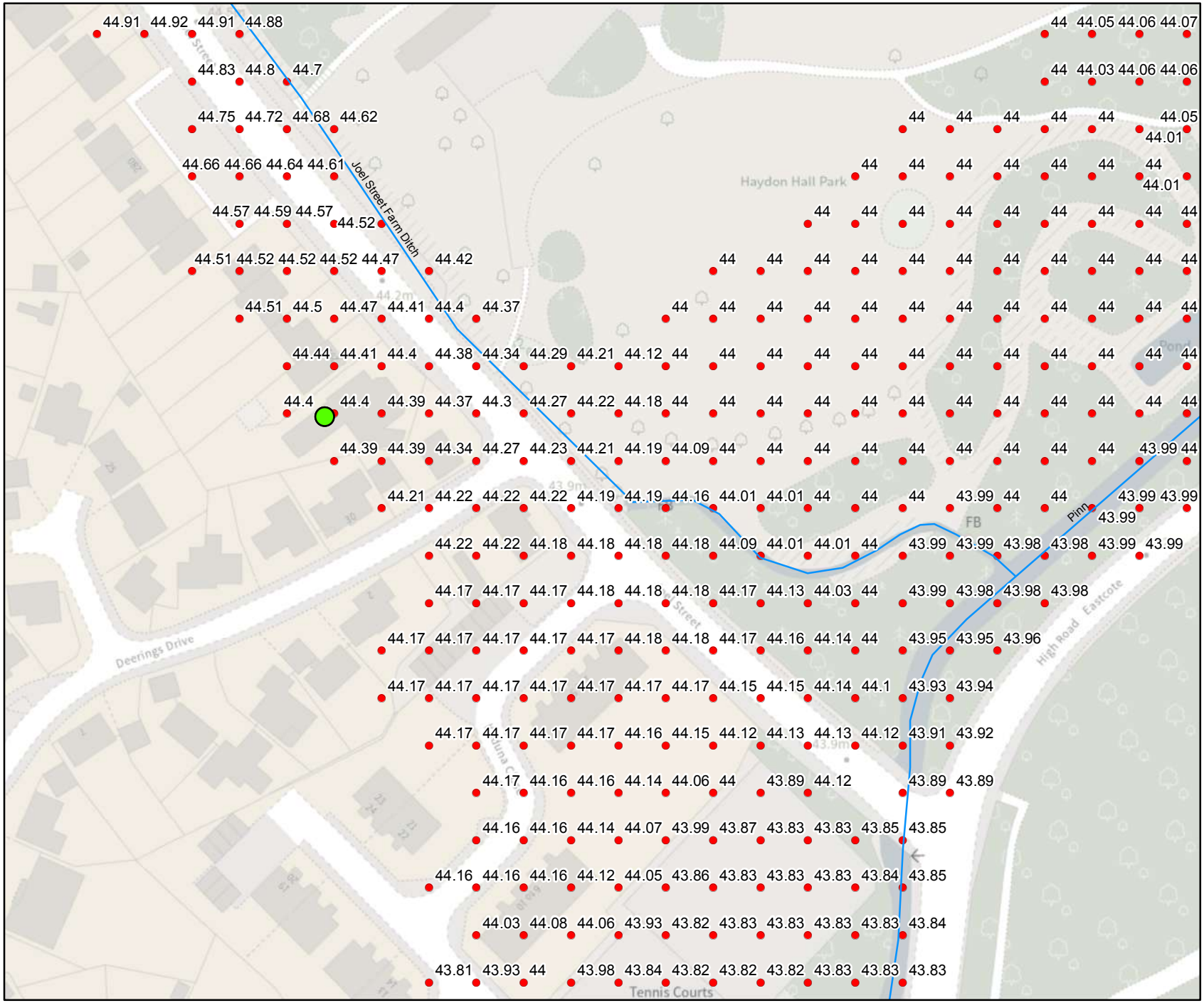

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Metres

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- Main Rivers
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2D Node Results: Heights

- 1 in 100 year + 20% (*CC) Defended

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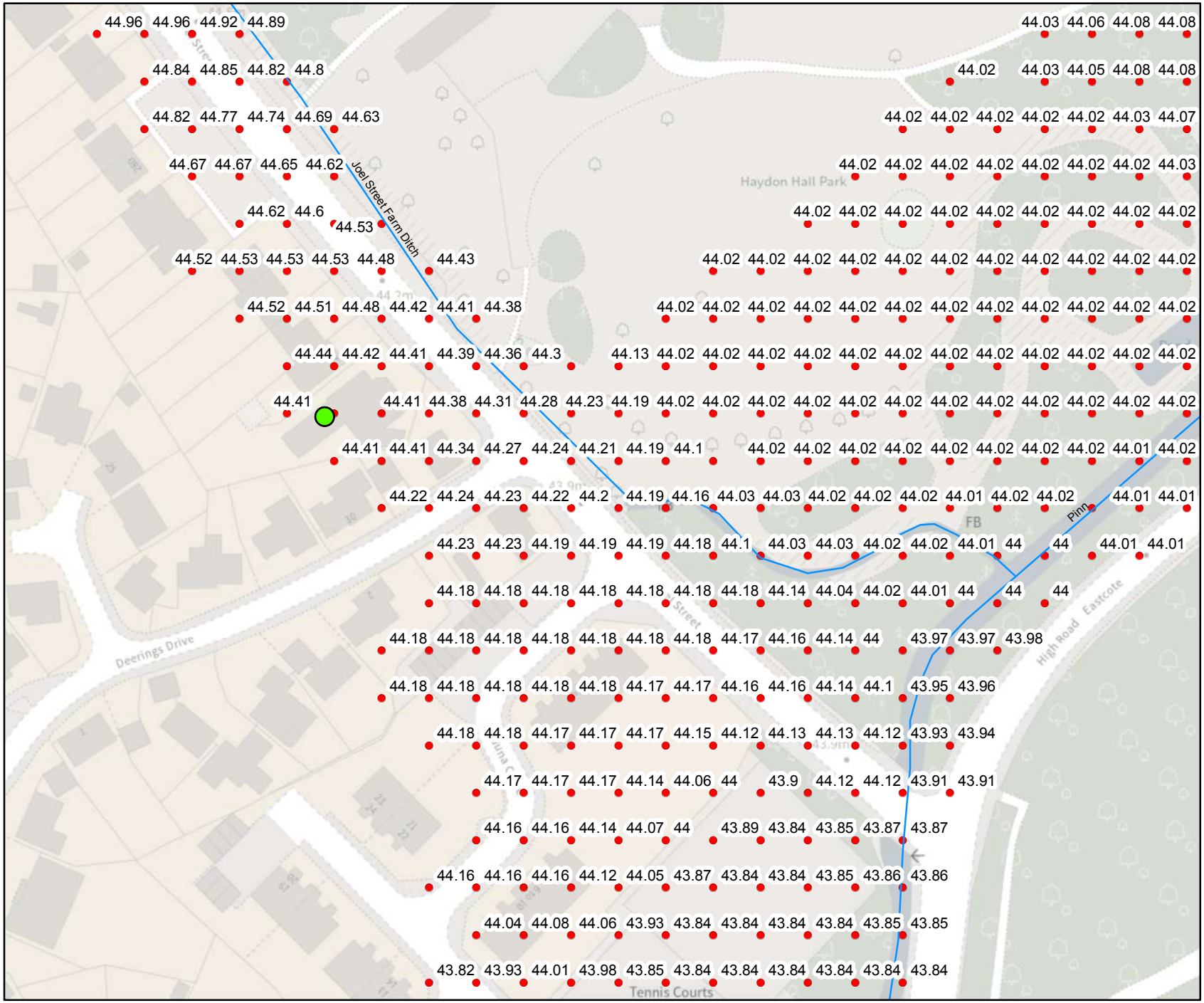

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0 15 30 60
Metres

Legend

- Main Rivers
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2D Node Results: Heights

- 1 in 100 year + 25% (*CC) Defended

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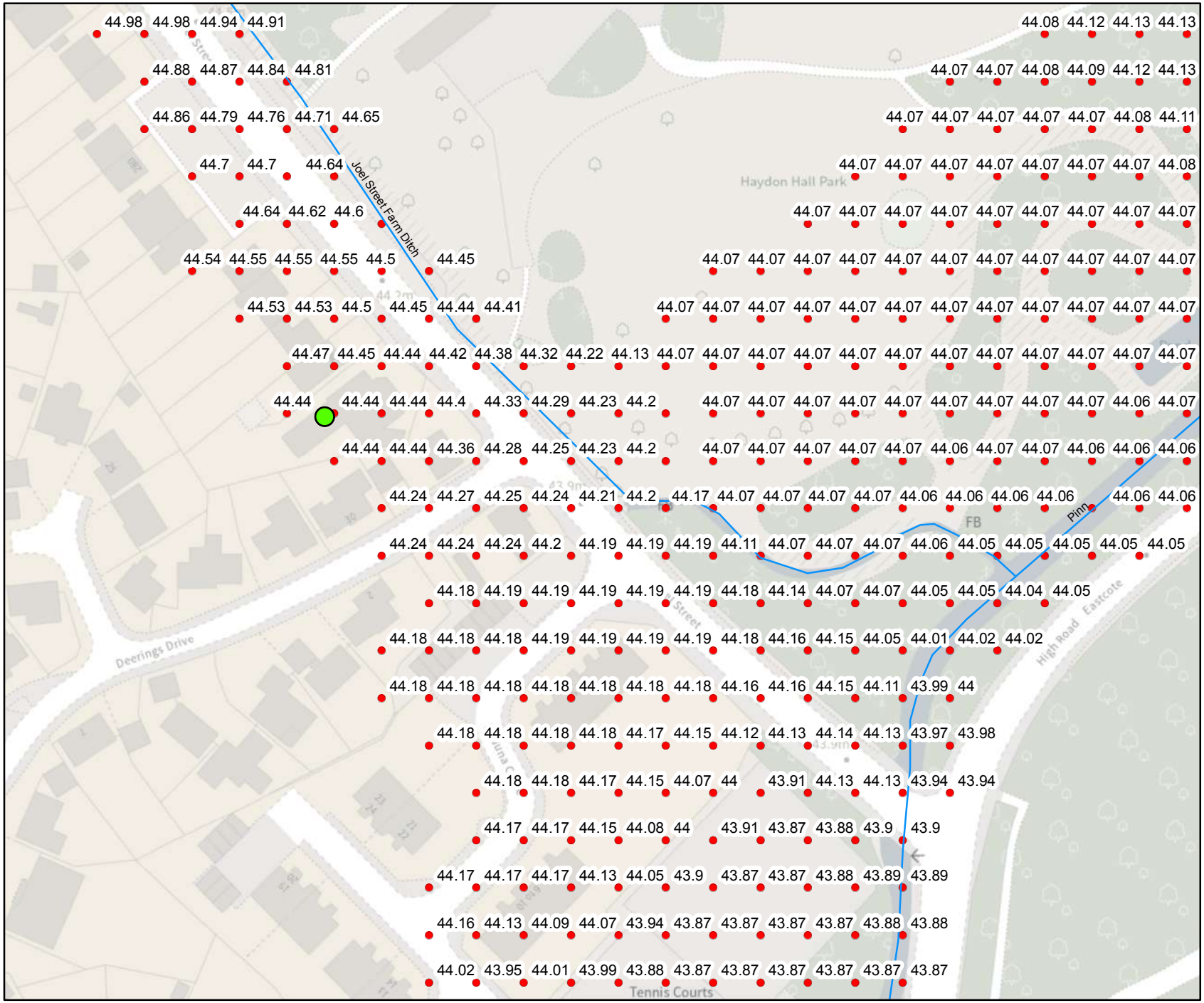

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AL7 1HE

N

0 15 30 60
Metres

Legend

- Main Rivers
- Site location

2D Node Results: Heights

- 1 in 100 year + 35% (*CC) Defended

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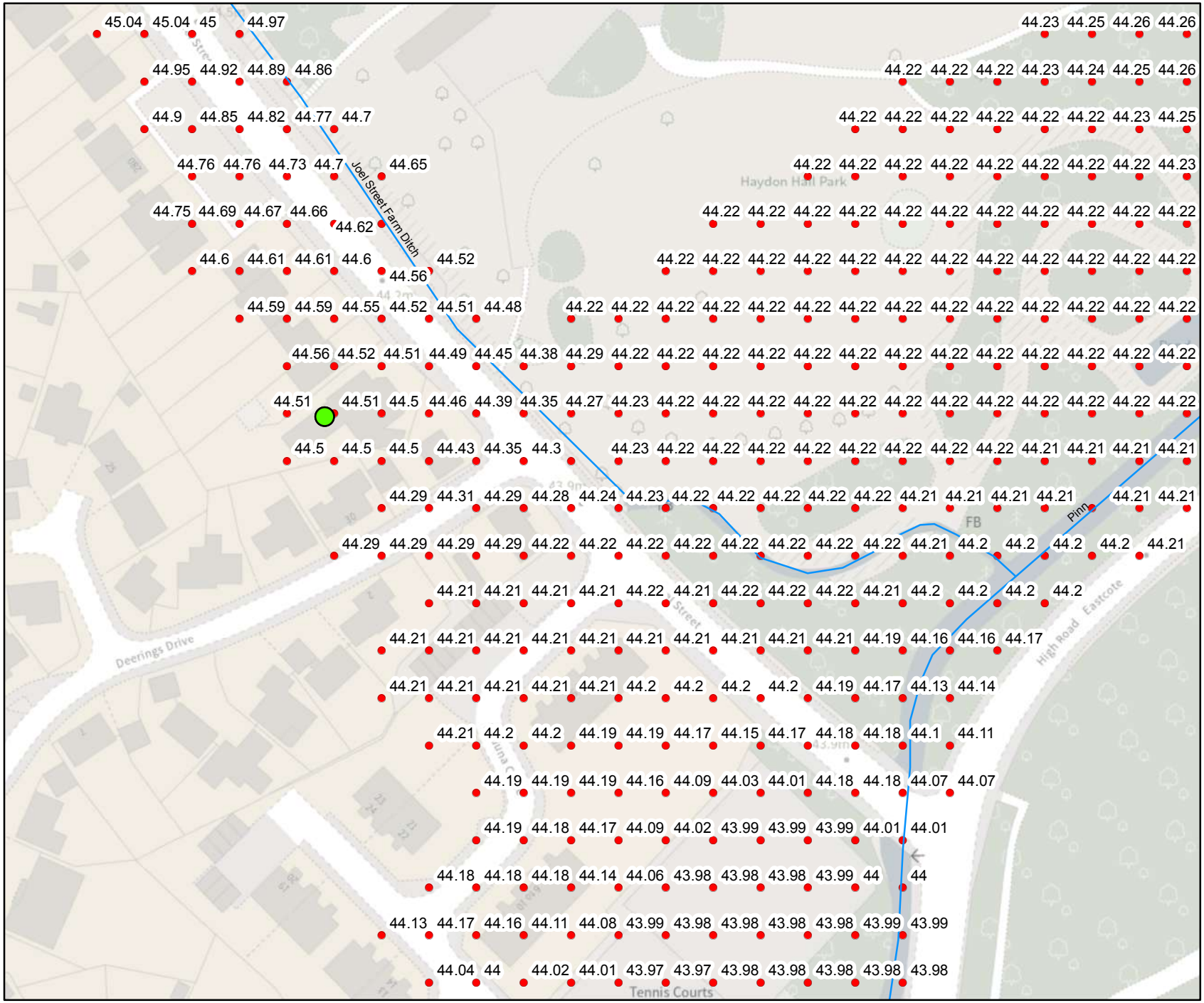
This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment.
Modelled outlines take into account catchment wide defences.
Flood risk data requests including an allowance for climate change will be based on the 1 in 100 flood plus 20% allowance for climate change, unless otherwise stated. You should refer to 'Flood risk assessments: climate change allowances' to check if this allowance is still appropriate for the type of development you are proposing and its location. You may need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.
https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London

Detailed FRA centred on: Haydon House, 296 Joel Street, HA5 2PY - 14/04/2022 - HNL 258175 HH



Environment Agency
Alchemy,
Bessemer Road,
Welwyn Garden City,
Hertfordshire,
AL7 1HE

N

0 15 30 60
Metres

Legend

- Main Rivers
- Site location

2D Node Results: Heights

- 1 in 100 year + 70% (*CC) Defended

The data in this map has been extracted from the River Pinn Mapping Study (JBA, 2015).
This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment.
Modelled outlines take into account catchment wide defences.
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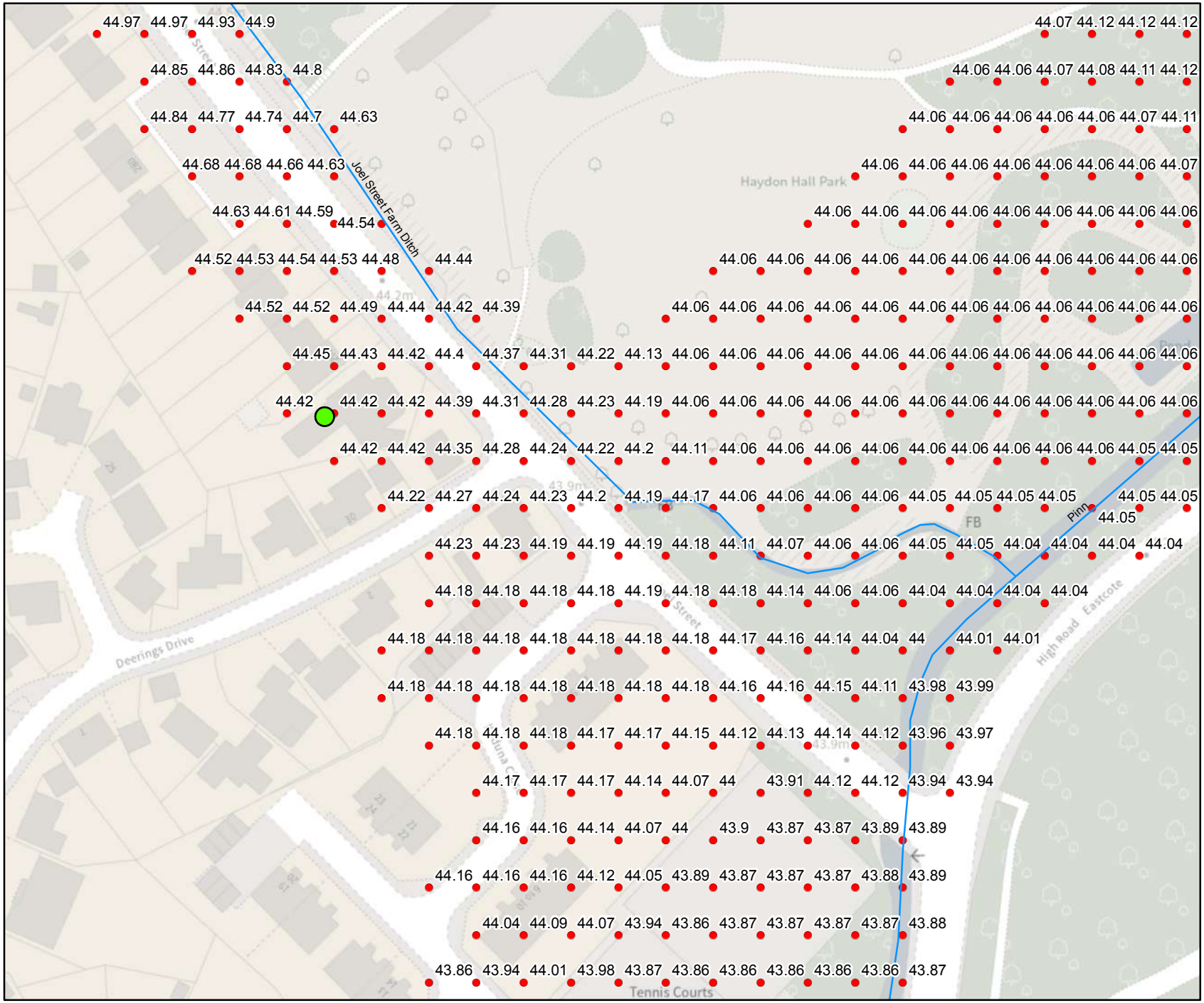
https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London

Detailed FRA centred on: Haydon House, 296 Joel Street, HA5 2PY - 14/04/2022 - HNL 258175 HH



Environment Agency
Alchemy,
Bessemer Road,
Welwyn Garden City,
Hertfordshire,
AL7 1HE

N

0 15 30 60
Metres

Legend

- Main Rivers
- Site location

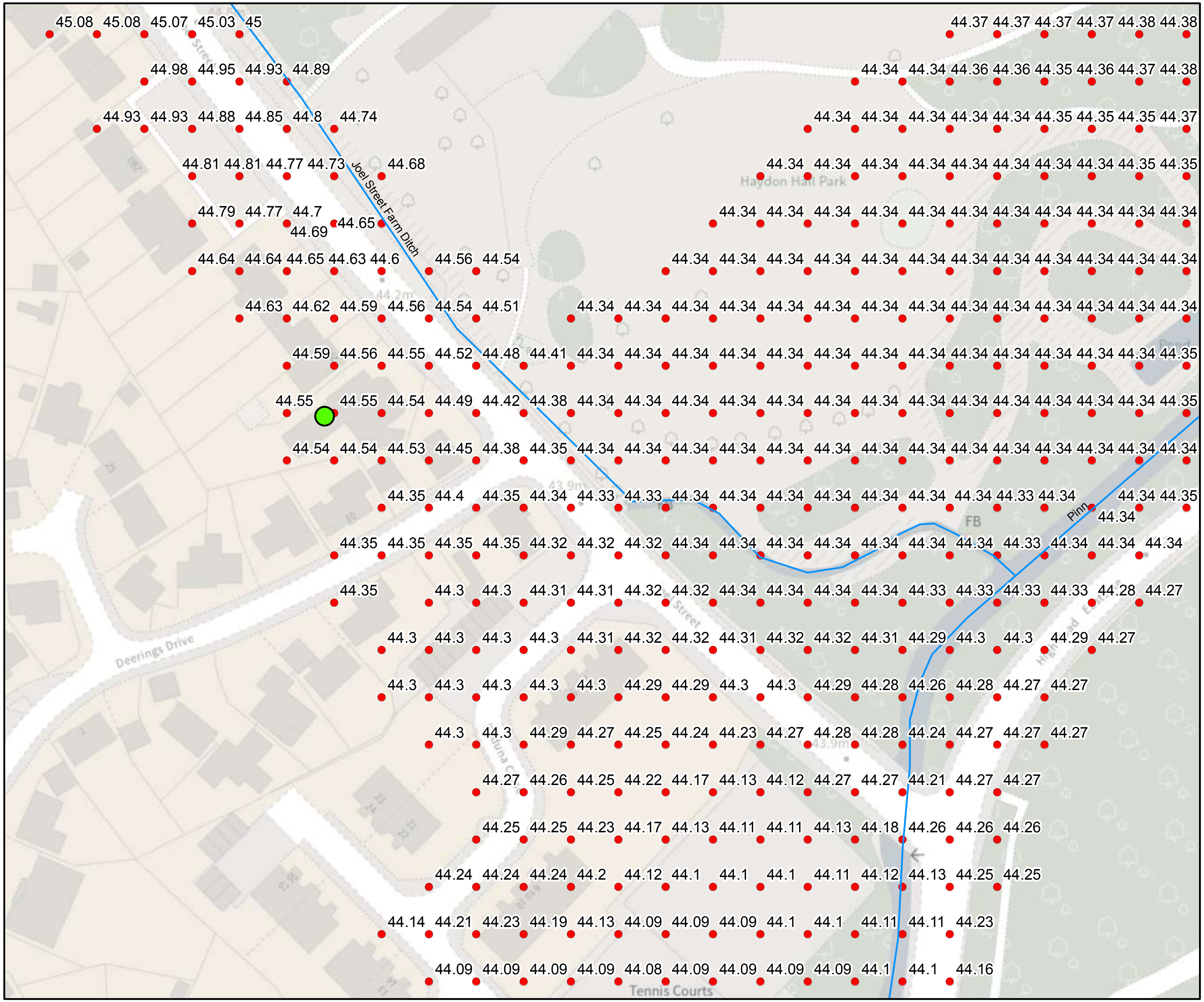
2D Node Results: Heights

- 1 in 250 year (0.4%) Defended

The data in this map has been extracted from the River Pinn Mapping Study (JBA, 2015).
This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment.
Modelled outlines take into account catchment wide defences.
Flood risk data requests including an allowance for climate change will be based on the 1 in 100 flood plus 20% allowance for climate change, unless otherwise stated. You should refer to 'Flood risk assessments: climate change allowances' to check if this allowance is still appropriate for the type of development you are proposing and its location. You may need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.
https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London

Detailed FRA centred on: Haydon House, 296 Joel Street, HA5 2PY - 14/04/2022 - HNL 258175 HH



Environment Agency

Environment Agency
Alchemy,
Bessemer Road,
Welwyn Garden City,
Hertfordshire,
AL7 1HE

N

0 15 30 60
Metres

Legend

Main Rivers

Site location

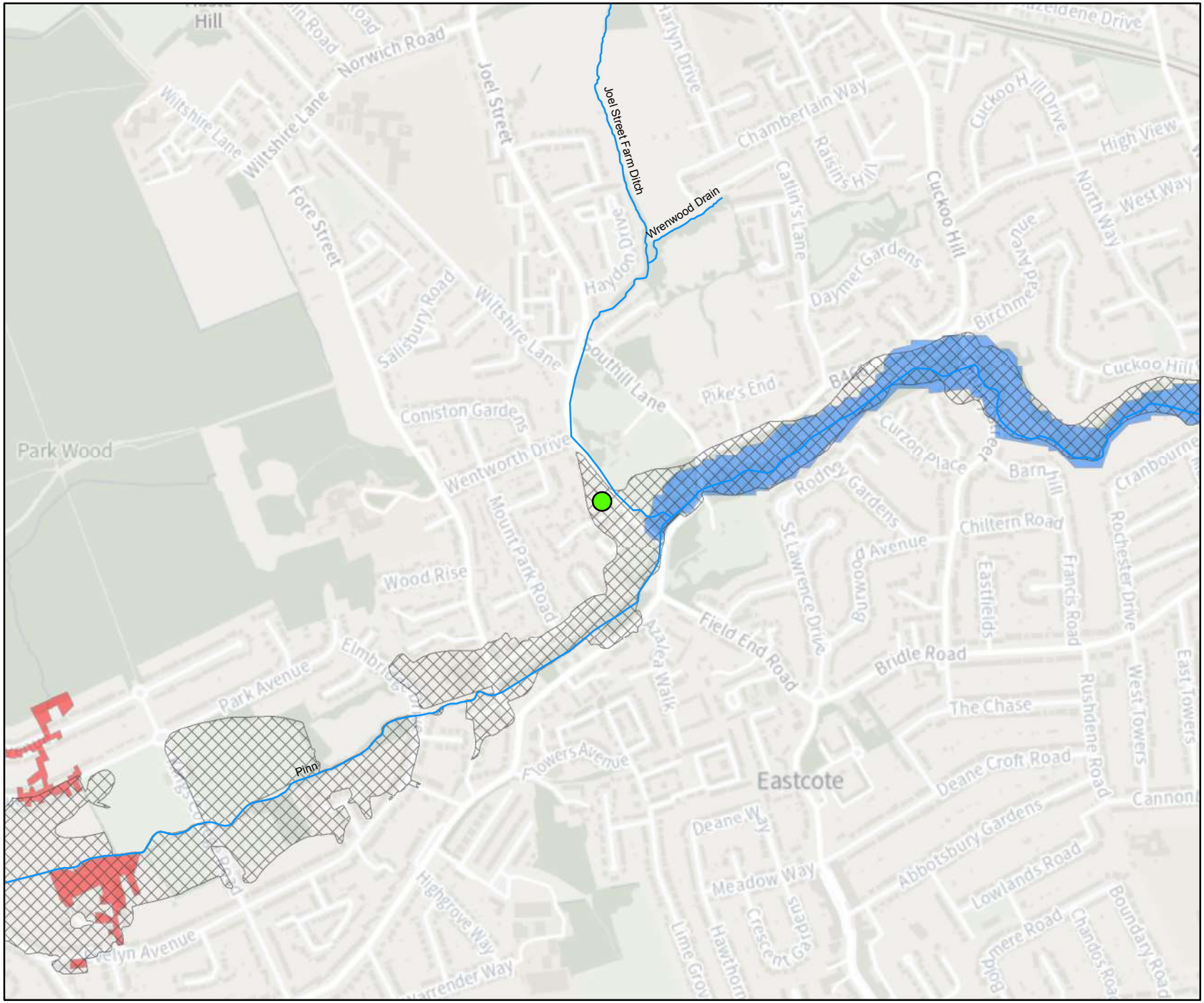
2D Node Results: Heights

1 in 1000 year (0.1%) Defended

The data in this map has been extracted from the River Pinn Mapping Study (JBA, 2015).
This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment.
Modelled outlines take into account catchment wide defences.
Flood risk data requests including an allowance for climate change will be based on the 1 in 100 flood plus 20% allowance for climate change, unless otherwise stated. You should refer to 'Flood risk assessments: climate change allowances' to check if this allowance is still appropriate for the type of development you are proposing and its location. You may need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.
https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London

Historic Flood Map centred on: Haydon House, 296 Joel Street, HA5 2PY - 14/04/2022 - HNL 258175 HH



Environment Agency
Alchemy,
Bessemer Road,
Welwyn Garden City,
Hertfordshire,
AL7 1HE

N

0 170 340 680
Metres

Legend

- Main Rivers
- Site location

Flood Event Outlines

- 1977
- 1988
- 2016

The historic flood event outlines are based on a combination of anecdotal evidence, Environment Agency staff observations and survey.
Our historic flood event outlines do not provide a definitive record of flooding.
It is possible that there will be an absence of datain places where we have not been able to record the extent of flooding.
It is also possible for errors occur in the digitisation of historic records of flooding.

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London

Appendix A.3 – Thames Water Asset Location Data

Asset location search

Property Searches

Herrington Consulting Limited
Barham Business Park,Unit 6 Barham Business Park

CANTERBURY
CT4 6DQ

Search address supplied

Splendid Hospitality Group Llp
Haydon House
296
Joel Street
Pinner
HA5 2PY

Your reference EG/3450

Our reference ALS/ALS Standard/2022_4628874

Search date 20 April 2022

Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0800 009 4540

Asset location search

Property Searches

Search address supplied: Splendid Hospitality Group Llp, Haydon House, 296, Joel Street, Pinner, HA5 2PY

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This searchprovides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

Waste Water Services

Please provide a copy extract from the public sewer map.

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an ‘as constructed’ record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

With regard to the fresh water supply, this site falls within the boundary of another water company. For more information, please redirect your enquiry to the following address:

Affinity Water Ltd
Tamblin Way
Hatfield

Asset location search

Thames Water Property Searches

AL10 9EZ
Tel: 0345 3572401

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

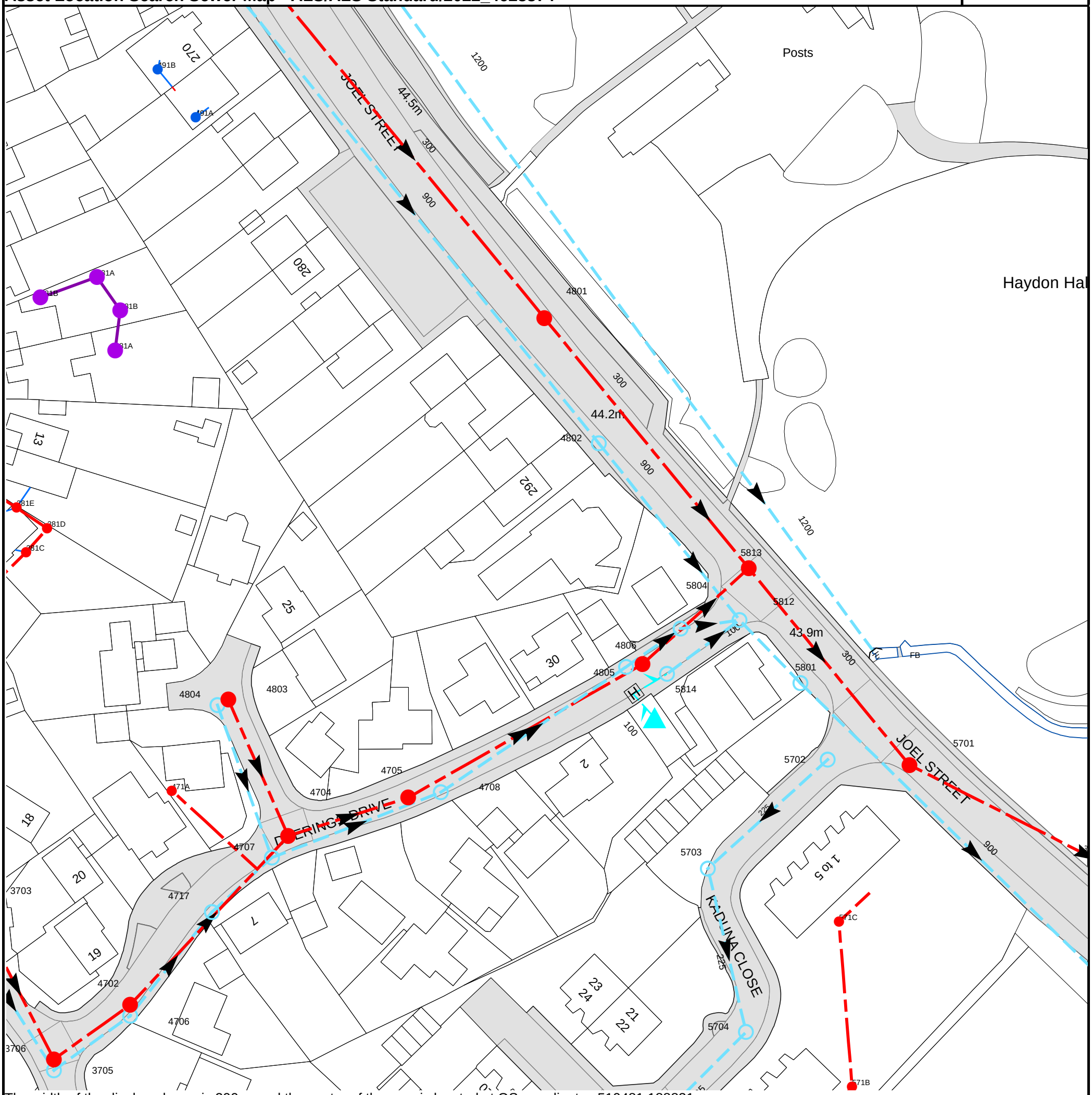
Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2022_4628874



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 510481,188831

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
381A	n/a	n/a
481A	n/a	n/a
481B	n/a	n/a
491B	n/a	n/a
491A	n/a	n/a
4801	44.2	41.3
4802	44.14	42.66
381B	n/a	n/a
571B	n/a	n/a
5704	43.83	42.84
571C	n/a	n/a
4717	n/a	n/a
5703	43.92	42.96
4707	n/a	n/a
4704	n/a	n/a
4705	n/a	n/a
4708	n/a	n/a
471A	n/a	n/a
5701	43.85	40.48
5702	43.84	43.08
4804	n/a	n/a
4803	n/a	n/a
5801	43.92	42.56
5814	n/a	n/a
4805	n/a	n/a
4806	n/a	n/a
5804	n/a	n/a
5812	n/a	n/a
5813	n/a	n/a
381C	n/a	n/a
381D	n/a	n/a
381E	n/a	n/a
3705	n/a	n/a
3706	n/a	n/a
4706	n/a	n/a
4702	n/a	n/a

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

- Storm Sewer
- Sludge Sewer
- Foul Trunk Sewer
- Surface Trunk Sewer
- Combined Trunk Sewer
- Foul Rising Main
- Surface Water Rising Main
- Combined Rising Main
- Vacuum
- Thames Water Proposed
- Vent Pipe
- Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

- Sewer
- Culverted Watercourse
- Proposed
- Decommissioned Sewer
- Content of this drainage network is currently unknown
- Ownership of this drainage network is currently unknown

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

- Air Valve
- Meter
- Dam Chase
- Vent
- Fitting

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

- Ancillary
- Drop Pipe
- Control Valve
- Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

- Inlet
- Outfall
- Undefined End

Other Symbols

Symbols used on maps which do not fall under other general categories.

- Change of Characteristic Indicator
- Public / Private Pumping Station
- Invert Level
- Summit

Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Chamber
- Operational Site

Ducts or Crossings

- Casement

Ducts may contain high voltage cables. Please check with Thames Water.

- Conduit Bridge
- Subway
- Tunnel

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plan are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL`s terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	**BACS Payment**	**Telephone Banking**	**Cheque**
Call **0800 009 4540** quoting your invoice number starting CBA or ADS / OSS	Account number **90478703** Sort code **60-00-01** A remittance advice must be sent to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.** or email **ps.billing@thameswater.co.uk**	By calling your bank and quoting: Account number **90478703** Sort code **60-00-01** and your invoice number	Made payable to '**Thames Water Utilities Ltd**' Write your Thames Water account number on the back. Send to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW** or by DX to **151280 Slough 13**

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.