



Level 2 Flood Risk Assessment

Teas Me Cafe, 6 Albert St, Lockwood, Huddersfield, HD1 3PR

Teas Me Cafe

April 2023

Project Information

Title	Level 2 Flood Risk Assessment
Job Code	92531
Sector	Flood Risk
Report Type	FRA
Client	Teas Me Cafe
Revision	A
Status	Final
Date of Issue	24 April 2023

Revision History

Revision	Date	Author	Reviewer	Approver	Status
A	20 th April 2023	WR	PR	AC	Draft
A	24 th April 2023	WR	PR	AC	Final

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1. Executive Summary

- 1.1 Aval Consulting Group Limited has been commissioned by Teas Me Cafe ('the client') to provide a Flood Risk Assessment in relation to a planning application at Teas Me Cafe, 6 Albert St, Lockwood, Huddersfield, HD1 3PR.
- 1.2 The proposed scheme comprises of single-storey extension to the existing building.
- 1.3 This report covers flood risk, potential developable land for the site.
- 1.4 A Level 2 Flood Risk Assessment has been carried out as per the requirements of the local authority. Both the Sequential and Exception Tests will be carried out as per the local authority's Strategic Flood Risk Assessment (SFRA) and the NPPF guidance. An evacuation plan has also been discussed.
- 1.5 No topographical or CCTV survey has been provided for this report.
- 1.6 The proposed surface water drainage discharge for the site is to be restricted to a maximum rate of 1.0 l/s which is subject to approval by Kirklees Council LLFA. This is proposed to discharge into the existing Yorkshire Water surface water sewer.
- 1.7 The proposed drainage is sustainable and will reduce the flow rate from the site. This will reduce the risk of off-site flooding for other properties and the green/blue roofs will contribute to the overall network performance in the area. The proposed surface water will be discharged into the existing public sewers.
- 1.8 The proposed foul water will be discharged into the existing combined drainage public sewer located along Albert Street.
- 1.9 The proposed development will also include information on surface water management and SuDS for the proposed development in order to reduce surface water discharge.

2. Introduction

Overview

- 2.1 AVAL Consulting Group Limited (ACL) has been commissioned by the client to produce a Flood Risk Assessment at Teas Me Cafe, 6 Albert St, Lockwood, Huddersfield, HD1 3PR. This is to accompany the planning application to the Local Authority for consent to undertake the proposed work.
- 2.2 This report will state the Flood Zone the development is located in and will analyse the risks of flooding at the site. Mitigation measures will also be discussed.
- 2.3 The existing and proposed development drawings are presented in Appendix A.

Site Location and Details

- 2.4 Figure 2.1 shows the proposed site location. The site is bounded by Albert Street to the south, Independent electrical services building to the west, Logwood Street to the east and Lockwood Road to the north.

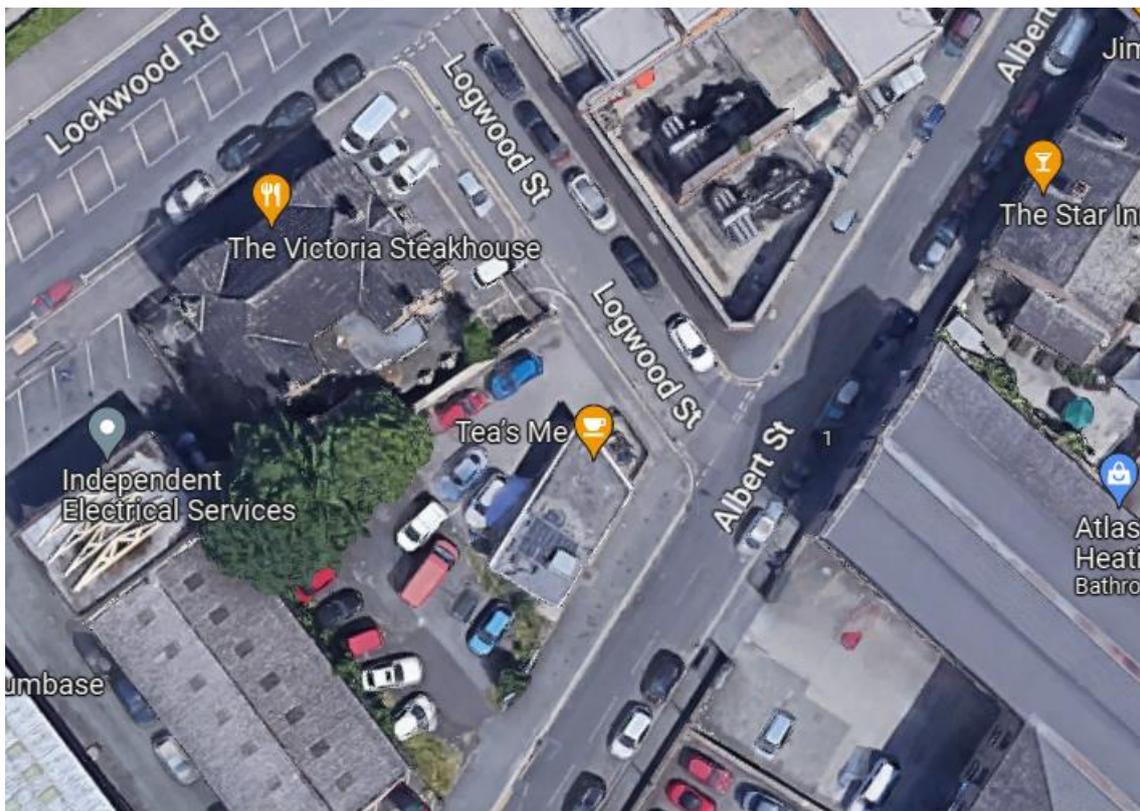


Figure 2.1: Proposed Site Location (Source: Google Maps)

Proposed Development and Vulnerability Classification

- 2.5 The proposed scheme comprises of rooftop extensions to the existing building, comprising infill extensions to the fourth floor comprising of additional office space, alongside extensions on the fifth floor comprising of a communal pavilion area, extended stair and lift core and shared roof terrace. Alterations to the existing building include replacement plant, modifications to the main entrance and refurbishment of the external façade.
- 2.6 As per the National Planning Policy Framework, the proposed development will be under the '**Less Vulnerable**' classification.

3. Relevant Standards and Policies

- 3.1 This section summarises all legislation, policy, statutory and non-statutory guidelines relevant to the proposed development. That also includes all the latest regional and local planning policy guidance specifically applicable to the proposed development.

The National Planning Policy Framework (NPPF)

- 3.2 The latest National Planning Policy Framework (NPPF) was published on 20th July 2021. The NPPF is supported by technical guidance set out within the Planning Practice Guidance for Flood Risk and Drainage, including the classification of the site vulnerability and the requirement do an Exception Test in relation to the Flood Zone and Vulnerability Classification.
- 3.3 One of the key aims of the NPPF is to ensure that flood risk is taken into account at all stages of the planning process to avoid inappropriate development in areas at risk of flooding and to direct development away from areas of highest risk.
- 3.4 It advises that where new development is necessary in areas of higher risk, flood mitigation resilience and resistance measures should be incorporated which can include but not limited to a higher finished floor level, installing flood boards and moving electrical points above. The developments upstream of the proposed development should also be taken into the consideration of flood risk.
- 3.5 The NPPF's flood risk advice is all set out in Chapter 14 of the Framework document, meeting the challenge of climate change, flooding and coastal change.

Flood and Water Management Act 2010

- 3.6 The Flood and Water Management Act 2010 received Royal Assent on 8th April 2010. This Act provides duties on the Environment Agency, Local Authorities, Developers and other bodies to manage flood risks. The Act has significant planning and design implications for Developers.
- 3.7 It should be noted that these standards and procedures are being reviewed by the respective regulatory bodies and third parties against the requirements imposed by the Flood and Water Management Act 2010. The advice and recommendations provided may change when associated regulations have been issued in order to implement the full scope of the Act.

3.8 Kirklees Council Flood Risk Management Strategy

The Kirklees Council Flood Risk Management Strategy, which highlights the flood risk management roles in Huddersfield, objectives of managing local flood risk, measures supporting the Kirklees Council Local Flood Risk Management Strategy, Local Flood Risk Management Strategy Action Plan, as well as states any historic flooding which can help in the analysis of a proposed development. This will be used in order to progress through this report.

4. Assessment of Flood Risk

Flood Zone Areas

- 4.1 The proposed development is located within a Flood Zone 3 area as per the Environment Agency's Flood Zone Map and the local authority's SFRA. Figure 4.1 shows the proposed development in Flood Zone 2 and 3 using ArcGIS layers from the Environment Agency.

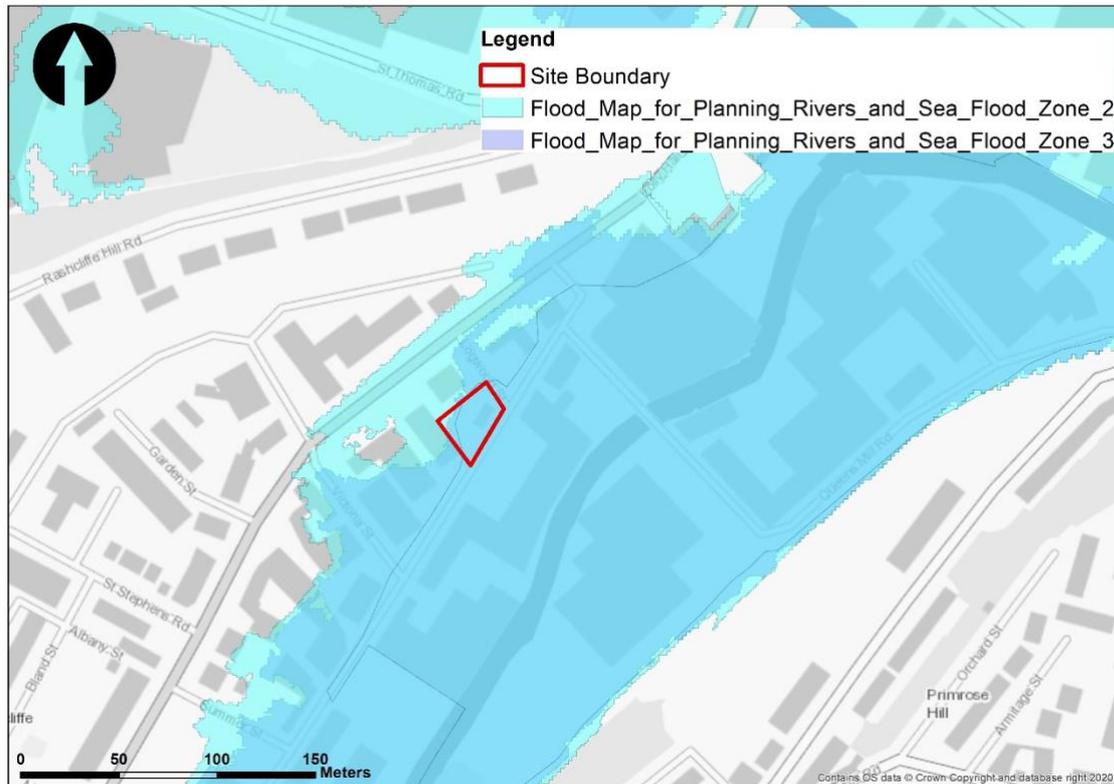


Figure 4.1: Flood Zone Area (Source: ArcGIS Layer from the EA)

River/Sea Flooding and Surface Water Flooding Risks

- 4.2 In terms of the risk of flooding from Surface Water and the River/Seas, the proposed development is at a very high risk of river/sea and at a high risk of surface water flooding as shown in Figures 4.2 and 4.3. Depths of surface water flooding under the low, medium and high risk can be seen in Figures 4.4 to 4.6.
- 4.3 It is to be noted that from Figure 4.3, the site is within a very low to no risk of surface water flooding. However, SuDS are proposed as part of the development and will help reduce the risk of flooding both within the site and surrounding areas for future years to come. Section 9 discusses SuDS in more detail.

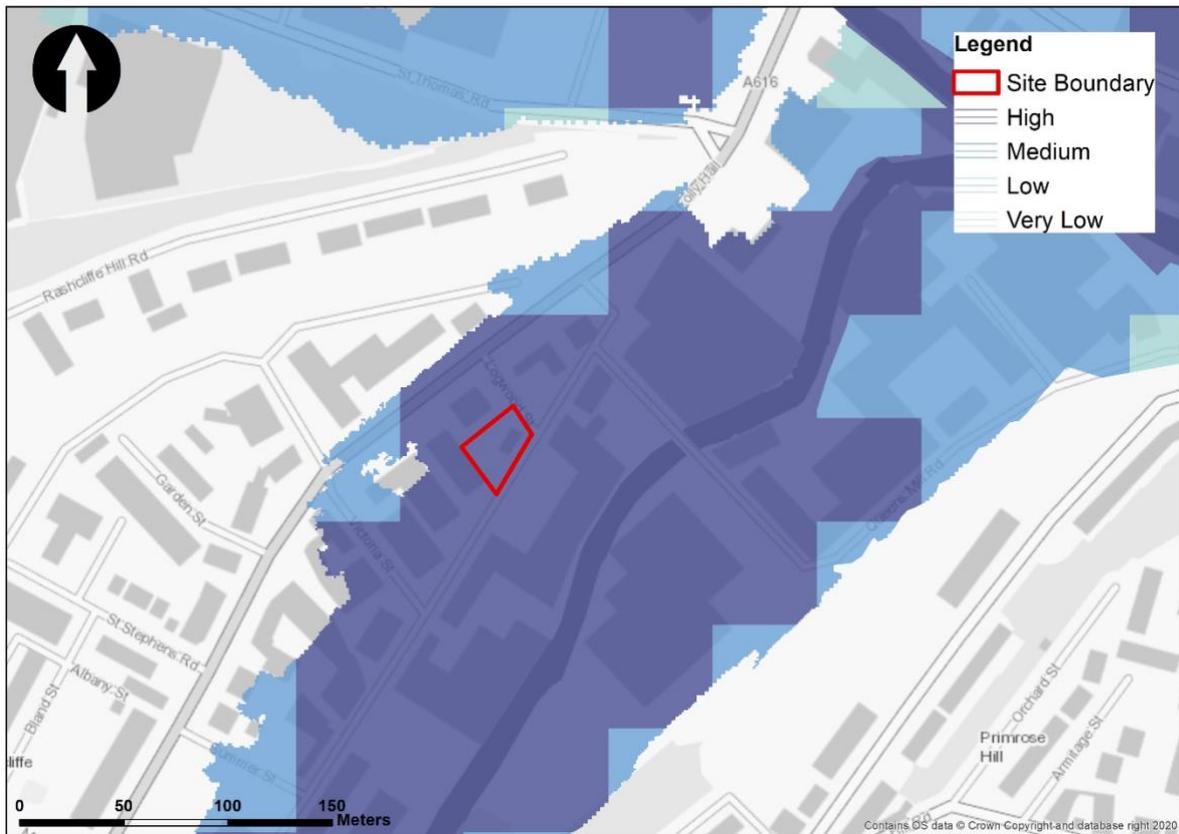


Figure 4.2: Extent of Flooding from River or the Seas (Source: ArcGIS Layer from the EA)

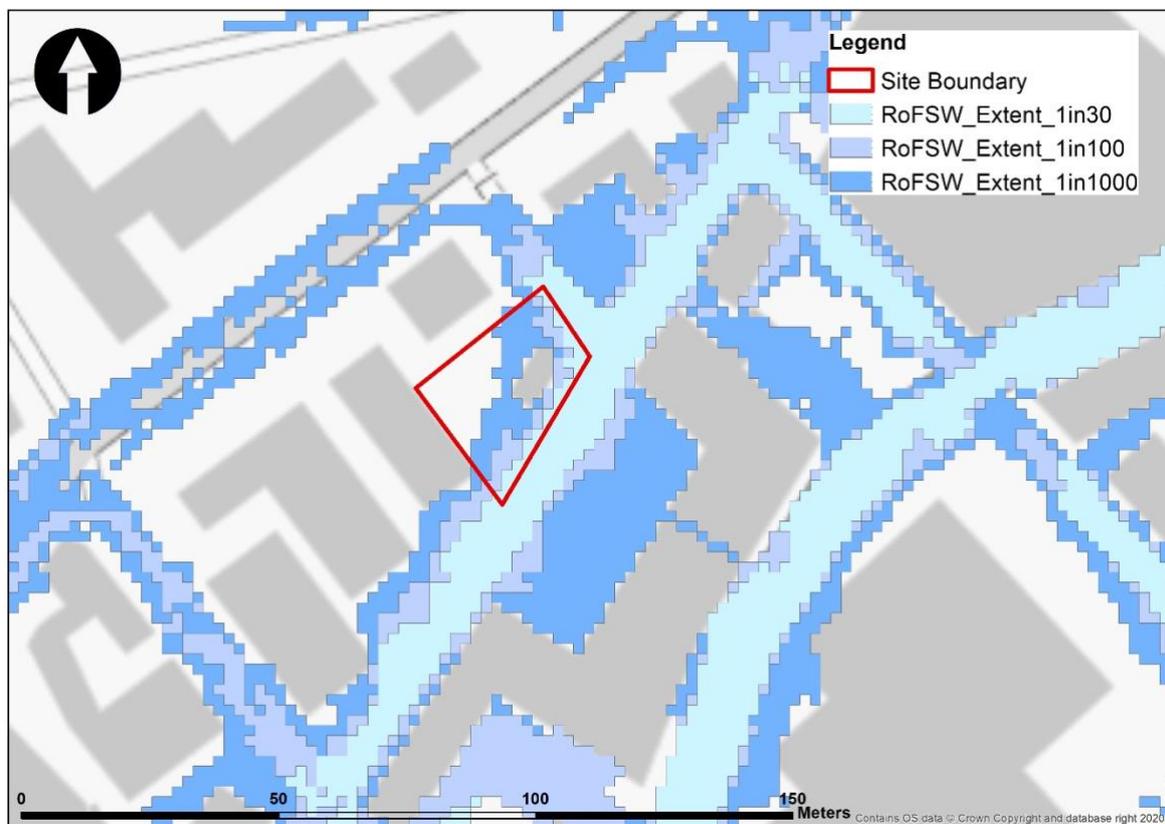


Figure 4.3: Extent of Flooding from Surface Water (Source: ArcGIS Layer from the EA)

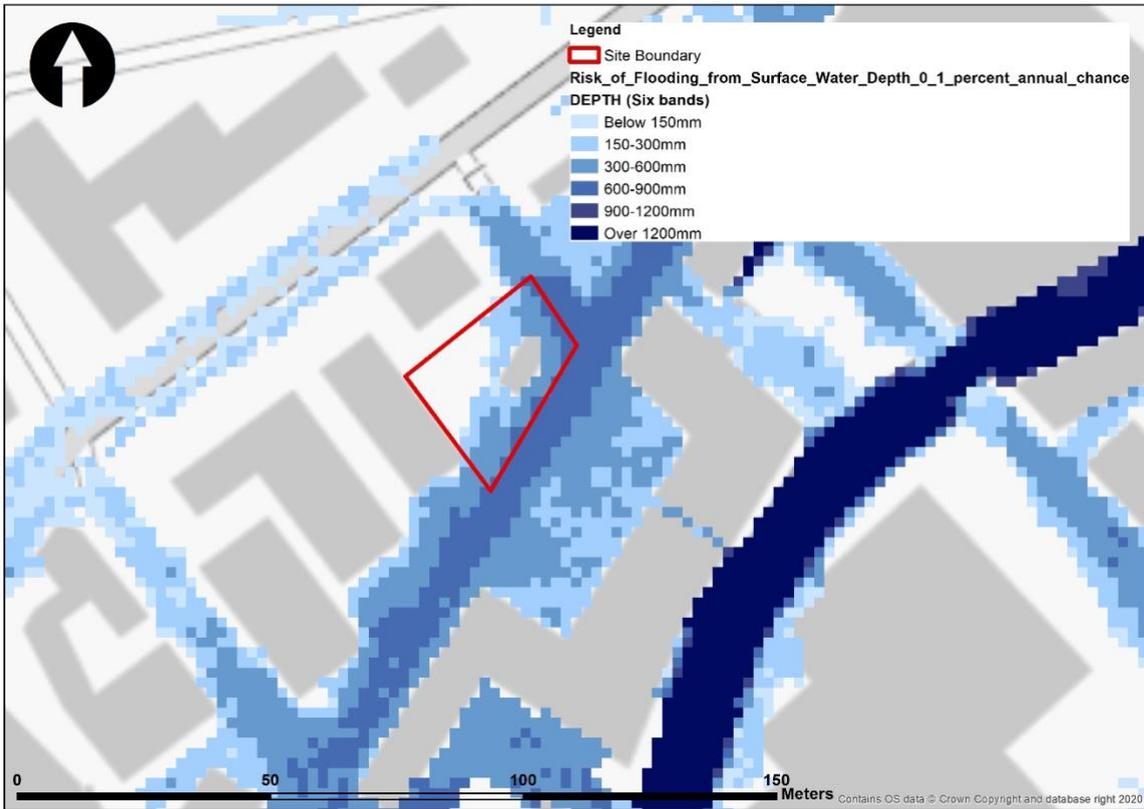


Figure 4.4: Depth of Surface Water – Low Flooding Risk (Source: ArcGIS Layer from the EA)

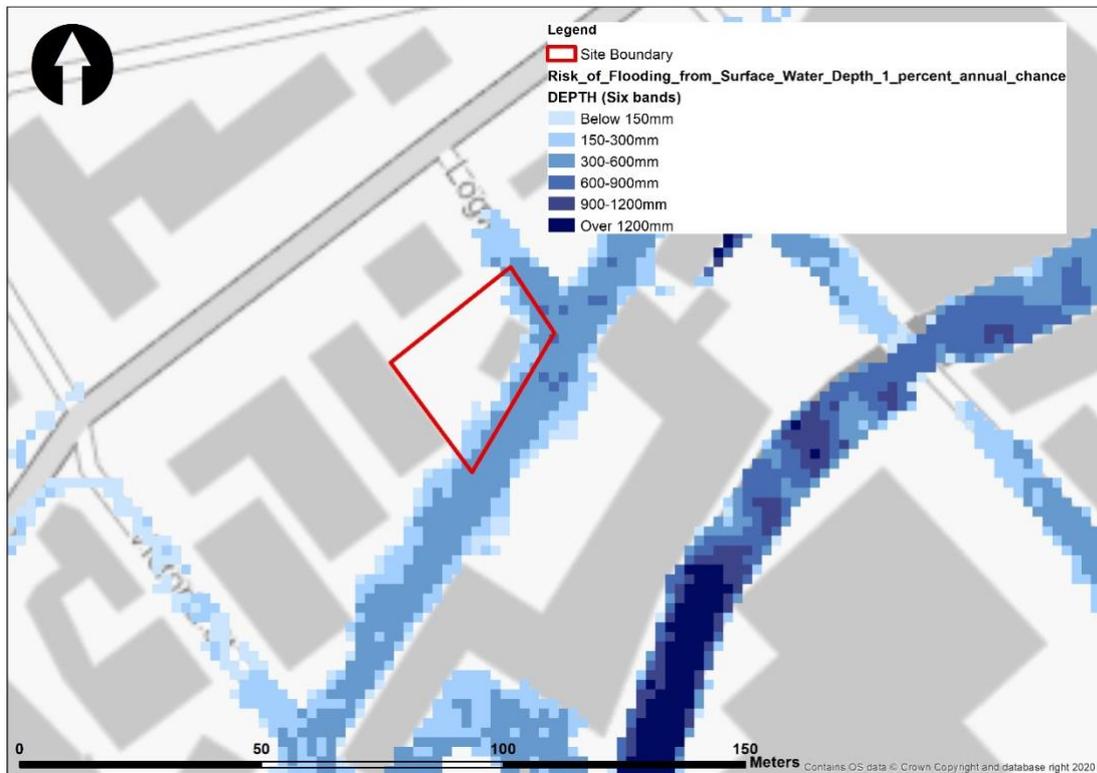


Figure 4.5: Depth of Surface Water – Medium Flooding Risk (Source: ArcGIS Layer from the EA)

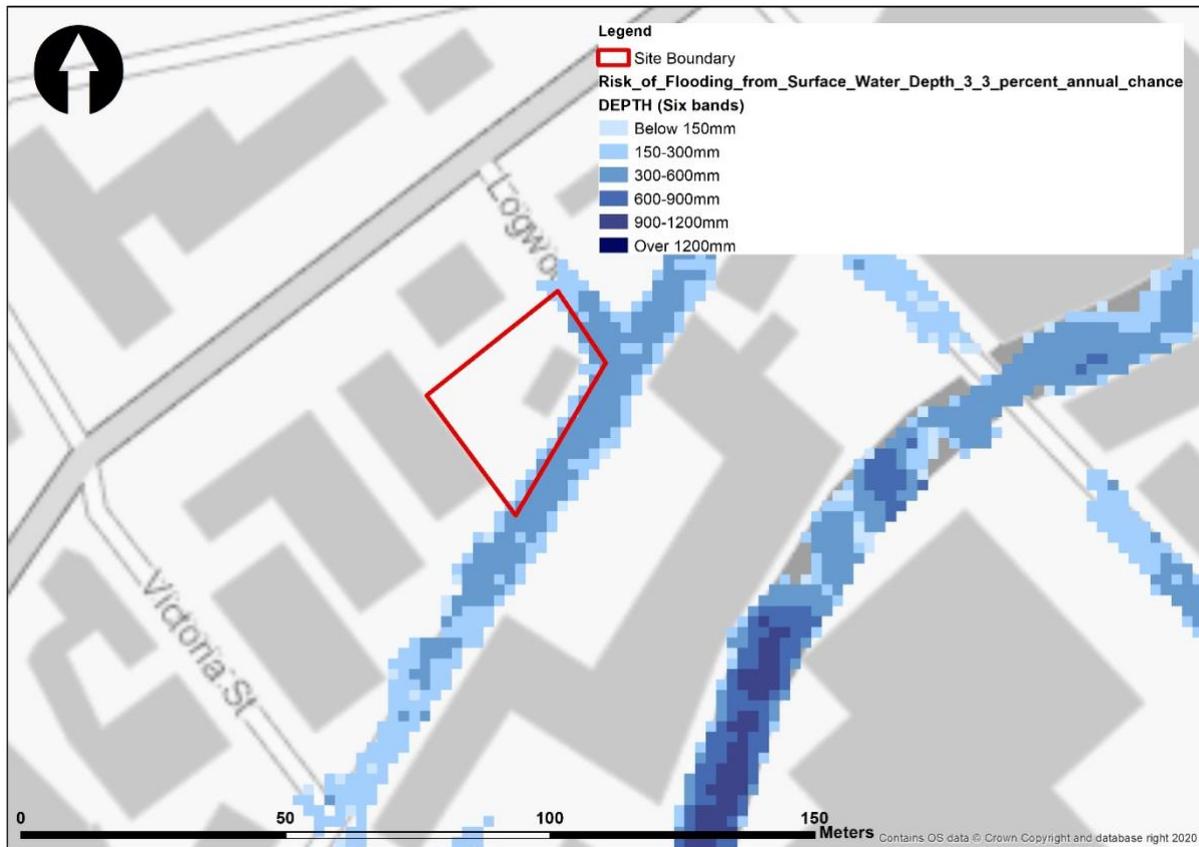


Figure 4.6: Depth of Surface Water – High Flooding Risk (Source: ArcGIS Layer from the EA)

Nearest Watercourse

- 4.4 The River Holme is located approximately 65m south-east from the site.

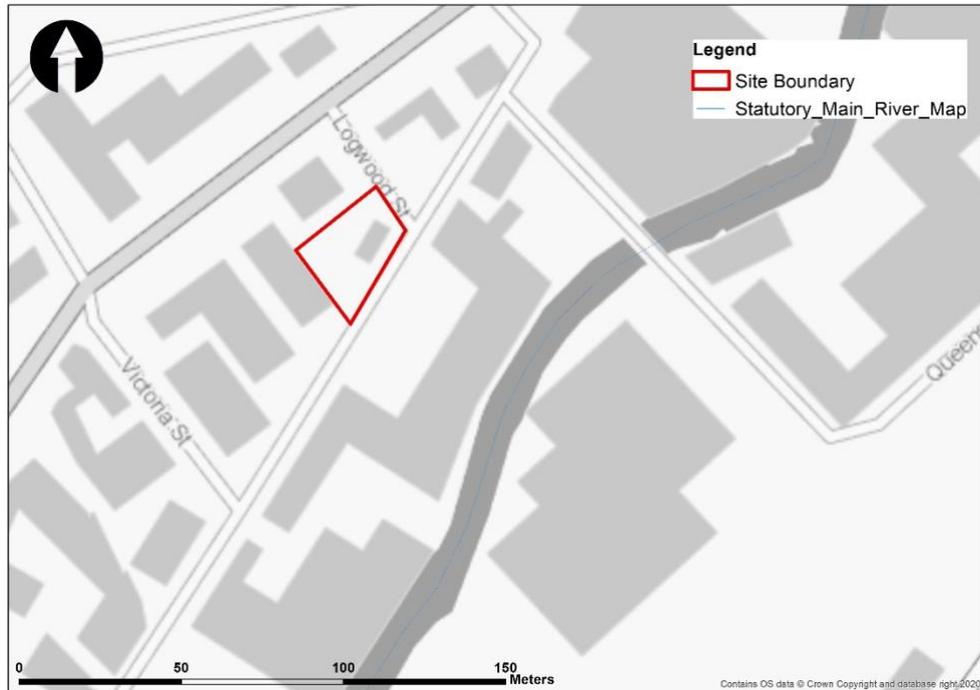


Figure 4.7: Nearest Watercourses (Source: Google Maps)

Other Sources of Flooding Risks and Historical Flooding

- 4.5 Soilscape maps indicating Loamy and clayey floodplain soils of coastal flats with naturally high groundwater.
- 4.6 As per Environment Agency and the Kirklees Council SFRA, the site has experienced previous flooding at the site.
- 4.7 According to Figure 4.8 of the EA recorded flood outlines the proposed site had been affected by previous flooding. Figure 4.9 indicates the site falls within a Flood warning area.

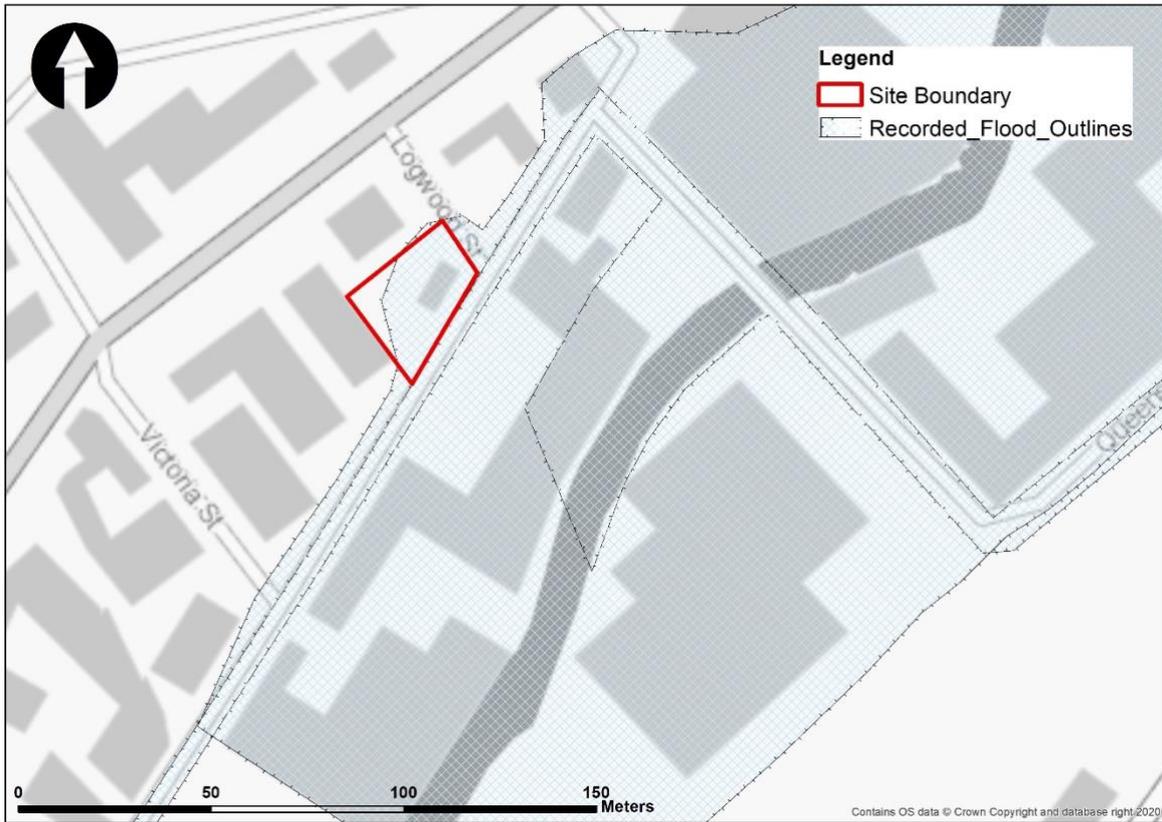


Figure 4.8: Recorded Flood Outline (Source: ArcGIS Layer from the EA)

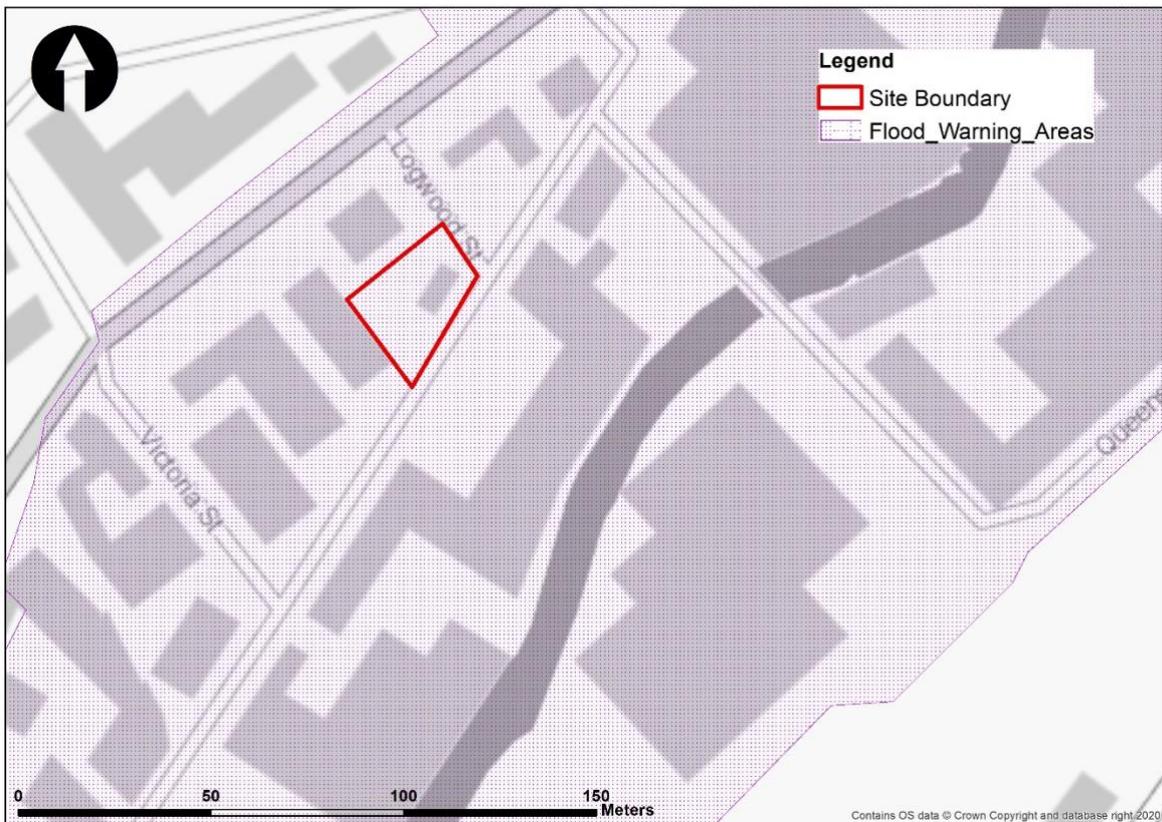


Figure 4.9: Flood Warning Areas (Source: ArcGIS Layer from the EA)

5. Residual Risk and Exception Test

- 5.1 This section will explain how the proposed development will reduce the flood risk within the site and within the surrounding areas of the site.

Residual Risk

- 5.2 The primary residual risk that would remain at the site would be the drainage of surface water. Flood Mitigation and Management details will be given in Section 6. However, additional residual risks remain such as a breach of a raised flood defence, blockage of a surface water conveyance system, overtopping of an upstream storage area, or failure of a pumped drainage system; failure of a reservoir; or a severe flood event that exceeds a flood management design standard, such as a flood that overtops a raised flood defence, or an intense rainfall event which the drainage system cannot cope with.
- 5.3 In order to further reduce the risk of surface water flooding within the proposed development, Sustainable Urban Drainage Systems would need to be installed to either safely discharge the surface water or to temporarily store the surface water for future use or discharge. This can be in the form but are not limited to, permeable paving, green roofs, attenuation storage or rainwater harvesting.

Exception Test

- 5.4 The National Planning Policy Framework sets out the different conditions in terms of the vulnerability of the development and the flood zone and accordingly sets out the requirements to do an Exception Test. The table below describes the conditions required for an Exception Test.

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	✗	✗	✗

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

- 5.5 As the development is located within a Flood Zone 3 and is classified as a 'Less Vulnerable', an Exception Test is not required to be undertaken to determine if the proposed development is appropriate.
- 5.6 Refer to Section 6 explains for further details on the mitigation measures.

6. Flood Mitigation and Management Measures

- 6.1 It has been proposed to introduce a new surface water system using green/blue roofs. The new drainage system will be designed in accordance with current design guidance and standards.
- 6.2 The use of site control measures, with controlled release of surface water to the public surface water sewer network will help to minimise the flood risk impact to the surrounding area.
- 6.3 To ensure that the proposed development will not increase flood risk elsewhere, surface water drainage discharge rates will be restricted. This restricted discharge in conjunction with surface water attenuation on site, will mitigate against flood risk to other land.
- 6.4 By reducing the pre-development peak runoff prior to its point of discharge, this will reduce the potential for surface water flooding on the downstream network.
- 6.5 The development and its drainage system will be designed to cope with the intense storm events up to and included the 100-year return period rainfall event with an allowance for climate change. If an extreme rainfall event exceeds the design criteria for the drainage network, it is likely that there will be some overland flows that are unable to enter the system.
- 6.6 Finished site levels will be engineered to provide positive drainage where required and prevent ponding. The accumulation of standing water will therefore not occur and thus not pose a risk.
- 6.7 Gradients of the hardstanding areas, where possible, are designed to fall away from buildings such that any overland flow resulting from extreme events would be channelled away from entrances.
- 6.8 As the site is located within a flood zone 3 area, the finished floor levels of proposed structures would need to be 300mm above the flood level. However, this is would not be achievable for this development as it is not feasible. Guidance from the EA states for developments in flood risk areas where you cannot raise the finished floor levels to the required height. You should design buildings to exclude flood water where possible and to speed recovery in case water gets in.
- 6.9 Therefore, the design should be appropriately flood resistant and resilient by:
- floor levels to be set 300mm above general adjacent road levels.
 - using flood resistant materials that have low permeability to at least 600mm above the estimated flood level
 - making sure any doors, windows or other openings are flood resistant to at least 600mm above the estimated flood level
 - using flood resilient materials (for example lime plaster) to at least 600mm above the estimated flood level
 - by raising all sensitive electrical equipment, wiring and sockets to at least 600mm above the estimated flood level.
 - making it easy for water to drain away after flooding such as installing a sump and a pump
 - making sure there is access to all spaces to enable drying and cleaning

- ensuring that soil pipes are protected from back-flow such as by using non-return valves

6.10 The use of SuDS site control measures, with controlled release of surface water to the existing surface water sewer will help to minimise the flood risk impact to the surrounding sewer networks.

Climate Change and Surface Water Management

- 6.11 The National Planning Policy Framework 2021 (NPPF) and accompanying Planning Practice Guidance indicate surface water run-off should be controlled as near to its source as possible through a sustainable drainage approach to surface water management.
- 6.12 Consideration should therefore firstly be given to using sustainable urban drainage (SuDS) techniques including soakaways, infiltration trenches, permeable pavements, grassed swales, ponds and wetlands to reduce flood risk by attenuating the rate and quantity of surface water run-off from a site. This approach can also offer other benefits in terms of promoting groundwater recharge, water quality improvement and amenity enhancements. The NPPF sets out a hierarchy for the disposal of surface water which encourages a SuDS approach, which will be mentioned in Section 7.29.

Climate Change

- 6.13 There are indications that the climate in the UK is changing significantly, and it is widely believed that the nature of climate change will vary greatly by region. Current expert opinion indicates the likelihood that future climate change would produce more frequent short-duration and high-intensity rainfall events with the addition of more frequent periods of long-duration rainfall.
- 6.14 The Environment Agency has highlighted the climate change allowance for all proposed developments as described in Section 7.

Small and Urban Catchment Climate Change Growth

The table below highlights the potential climate change expected in the future.

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	10%	20%	40%
Central	5%	10%	20%

As this development is for residential use, **a climate change growth factor of 40% is proposed** to be used for the surface water runoff/storage calculations.

Existing Public and Private Sewers

- 6.15 The existing site is currently brownfield with existing private drainage infrastructure located within the site.
- 6.16 There is evidence of public Yorkshire Water combined water sewer located along Albert Street.
- 6.17 A detailed Topographical survey and CCTV survey was not provided for this report. A survey will be required to confirm the location, depths and type of assets in the area.
- 6.18 Appendix B includes the Yorkshire Water Asset records.

Pre-development Surface Water Runoff

- 6.19 The total area of the proposed development site is circa **0.0562 hectares (ha)**.
- 6.20 The assumed existing permeable area is **0.00 hectares (ha)**
- 6.21 The assumed existing impermeable area is **0.0562 hectares (ha)**
- 6.22 The existing runoff of the site has been estimated using a combination of Modified Rationale Method and the IH124 method. The Modified Rationale Method is used for the impermeable areas with the IH124 method used for the permeable areas.

IH124 Method for Runoff Rates – Permeable Areas (Greenfield Runoff)

- 6.23 The runoff rates from the permeable (Greenfield) areas of the site have been initially calculated using the HR Wallingford Sustainable Tool which utilises either the Institute of Hydrology Report 124 Method or the FEH Statistics Method.
- 6.24 The IH124 publication provides the essential design elements for determining the estimated Greenfield runoff rate which is based on the site area, soil type, and average annual rainfall, which is influenced by the location of the site within the United Kingdom. This methodology is recommended within R&D Technical Report W5-074/A/TR/1 'Preliminary Rainfall Runoff Management for Developments '(2012).
- 6.25 The IH 124 equation to calculate runoff is:

$$Q_{bar} = 0.00108^{0.89} \dots SAAR^{1.17} \dots SOIL^{2.17}$$

Where:

Q_{bar} = Mean Annual Flood (m^3/s). A return period in the region of 2.3 years.

SAAR = Standard Average Annual Rainfall (mm)

A = Area (ha) of the catchment.

SOIL = Soil index value obtained from soil maps in the Flood Studies Report or the WRAP map of the Wallingford Procedure.

- 6.26 The SAAR value for the site and soil value were obtained automatically through the HR Wallingford website. The analysis for determining the peak Greenfield discharge rate uses 50 ha in the formula and linearly interpolates the flow rate value based on the ratio of the development to 50ha.
- 6.27 The Standard Percentage Runoff coefficient (SPR) values are determined by the SOIL category. These SOIL categories range from 1 to 5 with 1 being sandy highly permeable materials and 5 (rarely used) being exposed rock. Based on the Soil Type SPR value of 0.3 is proposed and a SOIL type of 2.
- 6.28 As mentioned above, the Qbar values represent a return period of 2.3 years. A regional growth factor can be applied to determine the peak runoff rate for other return periods including the 1 in 30 year and 1 in 100-year events. The growth factors are obtained from the tables in the Flood Studies Research FSSR 14 as shown below. The site is in Hydrological **Region 3**.
- 6.29 The peak runoff from the proposed impermeable area of 1.00 ha has been estimated using the Modified Rational Method $Q = 2.78 \times C_v \times C_r \times i \times A$ as 7.59 l/s. This is potential site runoff if the site were impermeable or ground conditions fully saturated.
- 6.30 Where:
- Q is the peak runoff rate (l/s)
 - C_v is the volumetric runoff coefficient = 1.3
 - C_r is the routing coefficient = 0.75
 - i is the average rainfall intensity = 50mm/hr
 - A is the Site impermeable area = 0.056ha

FEH Statistical Method for Runoff Rates

- 6.31 The second method of calculating existing runoff from a site is utilising the Flood Estimation Handbook Statistics for rainfall. This method is normally preferred by some Lead Local Flood Authorities and the Environment Agency as the method uses a wider statistical base and can consider the minutiae of catchment and soil characteristics which the IH124 method does not.
- 6.32 As with the IH124 method above, the HR Wallingford website provides an online tool which allows for the automatic calculation for the SAAR for the site.
- 6.33 The table below summarises the existing Greenfield runoff rates generated by the site for a range of storm return periods using the FEH Statistical method.

Table 5 - Existing Development Greenfield Runoff – FEH Statistical Method

Area (ha)	Q1 (l/s)	Q30 (l/s)	Q100 (l/s)	Q100+40% (l/s)
0.056	0.45	0.91	1.08	1.512

Post-development Surface Water Runoff

- 6.34 The proposed development is a mixture of car parking, access road, dwelling houses, apartment buildings and landscaped area. It has been assumed that the site is 85% impermeable, and 15% permeable based on the area calculations in Appendix A.
- 6.35 Like the existing runoff, rates have been calculated for the proposed development using the Wallingford Procedure. Runoff from the permeable soft landscaping has been ignored and is considered not to contribute.

Table 6 - Existing Development Greenfield Runoff – IH124 Statistical Method

Area (ha)	Q1 (l/s)	Q30 (l/s)	Q100 (l/s)	Q100+40% (l/s)
0.056	0.12	0.24	0.29	0.41

Proposed Restricted Discharge Rate

- 6.36 Planning policy requires that surface water runoff from existing brownfield sites is reduced to greenfield runoff where possible.
- 6.37 Consultation with Lead Local Flood Authority will be undertaken for a proposed discharge rate to sewer of 1.0l/s. Yorkshire Water will need to formally agree this discharge rate.
- 6.38 This discharge rate will be achieved using SuDS techniques including on-site attenuation and flow control methods.

Methods of Surface Water Management

- 6.39 As set out within the NPPF 2021, there are four methods that have been reviewed for the management and discharge of surface water for the site which are detailed below; these may be applied individually or collectively to form a complete strategy. They should be applied in the order of priority as listed:
- Discharge via infiltration;
 - Discharge via watercourse;
 - Discharge via a dedicated public surface water system; and
 - Discharged via a combined sewer.

Discharge via Infiltration

- 6.40 Any impermeable areas that can drain to a soakaway or an alternative method of infiltration would significantly improve the sustainability of any surface water systems.
- 6.41 SOIL mapping for the site suggests that the soils beneath the site may be suitable for infiltration. In line with Yorkshire Waters standard practice, the drainage will be required to discharge via soakaways. In the absence of permeability information for the site, the drainage assumption is to provide a piped system with limited discharge to the sewer, if following permeability tests, in line with BRE digest 365, the use of soakaways is found to be appropriate, the design will be reconsidered accordingly. As per standard practice, Yorkshire Water will require evidence that testing has been undertaken to demonstrate the suitability of soakaways.
- 6.42 Therefore, deeming the site not suitable for infiltration.

Discharge to a Watercourse

- 6.43 The next consideration for the disposal of surface water is via a watercourse. There are no nearby watercourses and therefore it is not possible to discharge via a watercourse.

Discharge via a Dedicated Surface Water Sewer

- 6.44 Following the above, the preferred option to discharge surface water is to the existing Yorkshire Water public combined sewer network.

Proposed Surface Water Discharge Strategy

- 6.45 The general principle of the surface water drainage strategy for this site is to collect the roof-top runoff and car parking area run-off and convey this to the existing private combined water manhole located within the site.
- 6.46 Calculations have been undertaken using the modified rational method (MRM) to calculate the pre-development discharge rate and assessed against the post-development discharge rates. The pre-development 1 in 100-year brownfield discharge rate is 22.7 l/s and as the existing impermeable area accounts for the whole site area it would therefore not increase the post-development flow. However the site aims to provide significant betterment by reducing the existing flow rates to greenfield run-off rates.
- 6.47 The proposed restricted discharge rate and calculated post-development runoff rates generate a storage requirement during periods of intense rainfall. This discharge volume will need to be temporarily stored before discharging to the existing sewer.
- 6.48 The proposed site discharge has been estimated at greenfield discharge rate of 1.0 litres per second which we will propose to Kirklees Council LLFA.
- 6.49 The Causeway Flow 'Quick Storage Estimate' module has been used to estimate the storage volume required for a 1 in 1-year, a 1 in 30-year and 1 in 100-year storm event plus a 40% allowance for climate change.
- 6.50 The required storage for the development is calculated using attenuation storage crates and a flow control device.
- 6.51 If storage crates are used, and assuming a 95% void ratio, the required volume of crates is between a minimum of **28m³** and maximum of **48m³**.

- 6.52 The restricted flow rate will be discharged via the existing Yorkshire Water public combined sewer. This is subject to a Section 106 agreement from Yorkshire Water.
- 6.53 This discharge rate will be achieved through the use of SuDS techniques including on-site attenuation and flow control methods via the green/blue roofs.
- 6.54 The surface water proposes to connect to the existing private combined water sewer network which connects to the existing Yorkshire Water combined water sewer asset located along Albert Street.
- 6.55 It is recommended to undertake a CCTV and topographical survey to confirm the location, depth, connection and current use of the private and public drainage networks located both within the private site and public highways.

7. Foul Water Discharge

- 7.1 It is proposed to install new wash basins/bathrooms which will connect to the existing combined water drainage system.
- 7.2 The existing combined water from the development connects to the public combined water sewer located on Albert Street.
- 7.3 The foul water system will be designed and constructed in accordance with the current Building Regulations, BS EN:752 drainage and sewer systems outside buildings, the local authority building control specifications and requirements, Sewers for Adoption 8th Edition and the Civil Engineering Specification for the Water Industry 7th Edition.
- 7.4 It is anticipated that foul water can discharge without any restriction.
- 7.5 Flow rate from the proposed development increases on the existing public combined sewer. A pre-development enquiry with the water authority will be required.
- 7.6 Indirect connection to the existing Yorkshire Water combined water sewer is subject to a S106 agreement from Yorkshire Water.
- 7.7 It is recommended to undertake a more intrusive CCTV survey to confirm the location, depth, connection and current use of the private and public drainage networks located both within the private site and public highways.

8. SuDS Appraisal and Proposed SuDS for Development

SuDS- General

- 8.1 Whilst the temporary storage volumes will be provided within an oversized pipework, the means by which the surface water is both stored and conveyed to the attenuation system should also incorporate various forms of Sustainable Drainage Systems (SuDS) where possible in accordance with the Environment Agency's general guidance and the National Planning Policy Framework.
- 8.2 Appropriately designed, constructed and maintained, SuDS are more sustainable than conventional drainage systems. Their benefits in general terms are summarised below.

SuDS can:

- Reduce run-off surface water flow-rates and/or volumes and hence reduce the risk of flooding;
- Encourage natural groundwater re-charge;
- Reduce pollutant concentrations in storm water;
- Provide habitats for wildlife.

SuDS Appraisal

There are many site-specific factors which will influence the choice of any single or combination of SuDS device used within a development. The primary factors are:

- Whether the development is domestic, commercial or industrial;
- Whether the underlying ground is contaminated. If so, infiltration systems (soakaways) will most probably not be permitted;
- Whether the underlying ground is permeable enough for infiltration systems (soakaways) to be considered;
- Whether the groundwater levels are deep enough for infiltration systems (soakaways) to be considered;
- Whether the site is steeply sloping and its general topography;
- The availability of space inside the development for each potential SuDS facility;

Health and Safety aspects should the development be likely to be inhabited or used by children.

Types of SuDS with Respect to Proposed Development

- 8.3 Based on local and regional policy, the primary SuDS elements proposed for this development are outlined below:

Oversized Pipes/Gutters

- 8.4 Slightly oversized pipes can also help in the temporary storage of surface water but can also help in the discharge of surface water from the roof without any major blockages. Gutters can also help take more surface water from the roof into the oversized pipes, thus reducing the pressure on the attenuation storage crates which can then be made smaller.

Flow Control Devices

- 8.5 Hydrobrakes and orifice plates can be used to restrict the discharge rate of surface water as it allows for a controlled discharge of surface water whilst not causing any potential flooding within the site and elsewhere (alongside storage).
- 8.6 The site includes a hydrobrake and orifice plate to discharge the surface water at a maximum rate of 1.0 l/s.

Attenuation Storage

- 8.7 Attenuation storage can assist with the temporary storage of surface water whilst also allowing for a reduction in discharge rate. This will benefit by preventing any potential flooding at the site or elsewhere.

Permeable Paving

- 8.8 Permeable Paving would allow for sustainable surface water drainage as well as to absorb pollutants and impurities from vehicles and surface water which can stop water pollution, therefore improving the environment.

9. Maintenance

9.1 The maintenance of the drainage system within the proposed development site will be managed by the owner of the proposed development. All maintenance operations should be carried out in accordance with the manufacturer's recommendations and maintenance guidance's.

Surface Water Drains

Maintenance Activity	Remedial Action	Inspection Frequency
Conducting checks on the structure of drains and clearing of dirt and slit within the drains.	Removing the dirt/silt as required and if required to restructure/replace the drains to optimise operation.	Take action as required

System Inlets

Maintenance Activity	Remedial Action	Inspection Frequency
Conducting checks on drainage rainwater pipes inlets, inspection chambers, for dirt/silt and blockages	Removing the dirt/silt/blockages as required to ensure continued operation and to prevent dirt/silt/blockages from entering the drains.	Minimum yearly inspections

Other SuDS Features

Maintenance Activity	Remedial Action	Inspection Frequency
Conducting checks on Aquacell Storage crates for dirt/silt/blockages	Removing the dirt/silt/blockages from storage units if required. To repair/restructure the crates if necessary	Minimum yearly inspections
Conducting checks on Hydrobrake for dirt/silt/blockages and wear/damages.	Removing the dirt/silt/blockages if required. To repair device if necessary from wear and damage.	Minimum yearly inspections

10. Conclusion

- 10.1 The proposed development sites are located within a Flood Zone 3a, with a high risk of river/sea flooding and a very low risk of surface water flooding.
- 10.2 As per the SFRA, the proposed development site is suitable for development and an Exception test was not required as per the NPPF due to the development being a less vulnerable development.
- 10.3 The Flood Risk Assessment (FRA) has reviewed all sources of flood risk to both the proposed development and to existing adjacent developments because of the proposals, including fluvial, tidal, pluvial, groundwater, sewers and flooding from artificial sources and found the risks to be high.
- 10.4 According to the SOIL mapping infiltration is a viable option and as per standard practice, Anglian Water will require evidence that testing has been undertaken to demonstrate the suitability of soakaways. The infiltration tests should be undertaken in line with BRE digest 365, to confirm if the use of soakaways is appropriate. If appropriate, the design will be reconsidered accordingly.
- 10.5 The surface water proposes to connect to the existing private combined water sewer network which connects to the existing Yorkshire Water combined water sewer asset located along Albert Street. Which is subject to a formal approval by Yorkshire Water.
- 10.6 The foul Water is proposed to be discharged unrestricted to the existing Yorkshire Water public combined water sewer located south of the site and flows downstream along Albert Street. Which is subject to a formal approval by Yorkshire Water.
- 10.7 The implementation of alternative SuDS such as green/blue roofs will be proposed.
- 10.8 Additional CCTV and topographical survey will need to be undertaken to identify and confirm the location and depth of the private combined water asset located within the existing building.
- 10.9 4Product 4 data confirms there are flood defences to protect the existing building and as the proposed development is for an upward extension which falls well above the modelled flood depths, there is no flood risk to the existing or surrounding buildings.
- 10.10 The development is accessible for emergency access and egress during times of extreme flooding as no potential flooding is evident on any of the access routes.
- 10.11 The Flood Risk Assessment is commensurate with the development proposals and in summary, the development can be considered appropriate for the Flood Zone in accordance with the NPPF.

Appendices

Appendix A: Existing and Proposed Site Plans

Appendix B: Yorkshire Water Asset Records

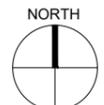
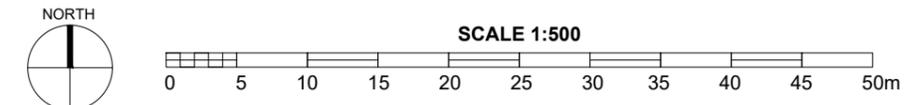
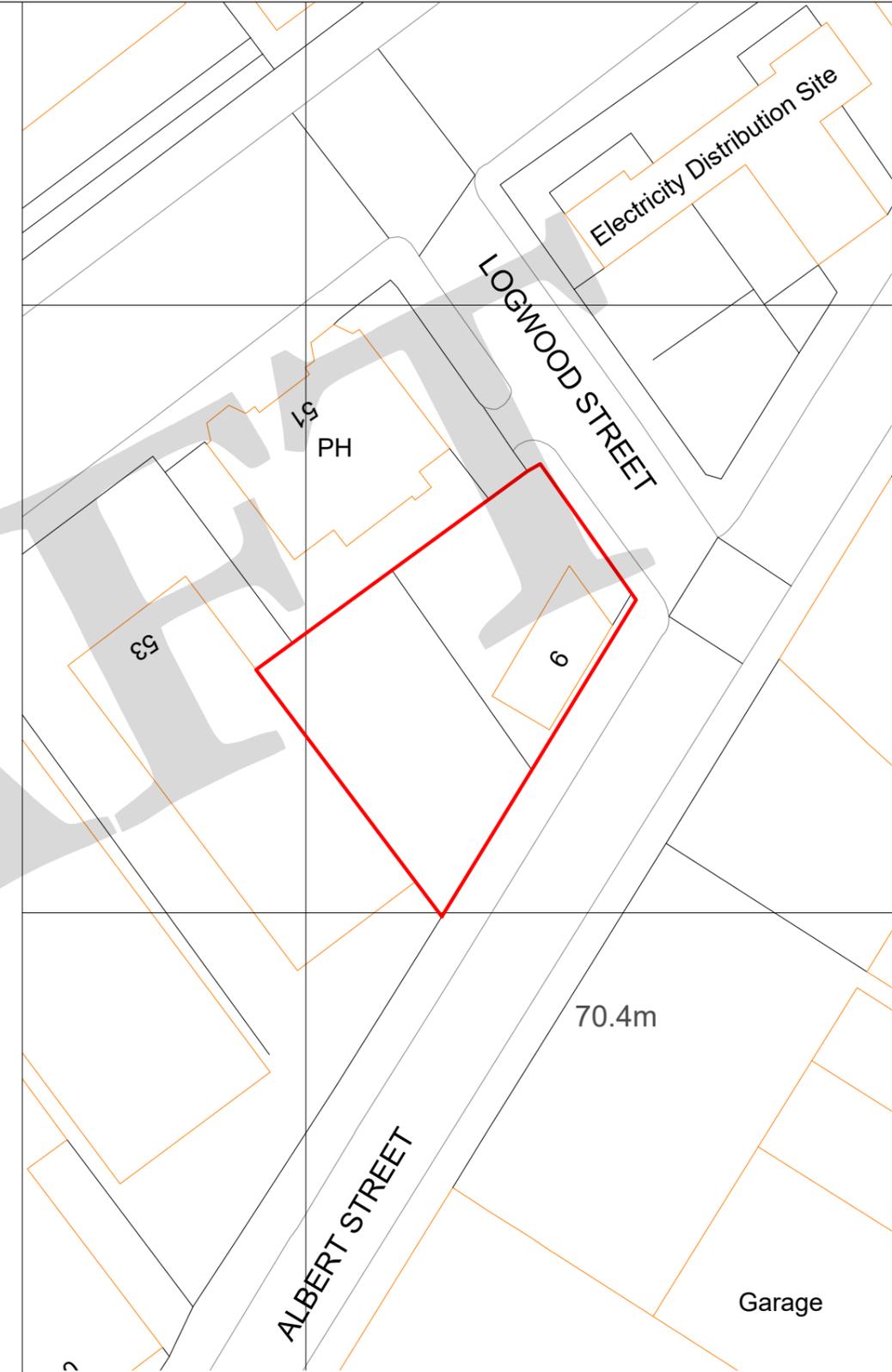
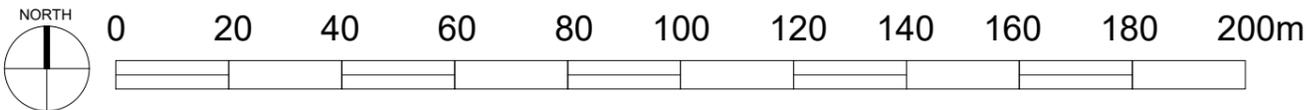
Appendix A: Existing and Proposed Site Plans



01856 898 022
www.UKPlanningMaps.com



Produced on 03 January 2023 from the Ordnance Survey National Geographic Database and incorporating surveyed revision available at this date.
This map shows the area bounded by 414032 415667, 414174 415667, 414174 415809, 414032 415809, 414032 415667
Crown copyright and database rights 2023 OS 100054135. Supplied by copla ltd trading as UKPlanningMaps.com a licensed Ordnance Survey partner (OS 100054135).
Data licence expires 03 January 2024. Unique plan reference: v2c/890730/1202292



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Or:
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Revisions List:

No.	Description	Date



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0161 327 2529

Address: Teas Me Cafe,
6 Albert St,
Lockwood,
Huddersfield,
HD1 3PR

Title: Location and Site Plans **Drawn:** HA

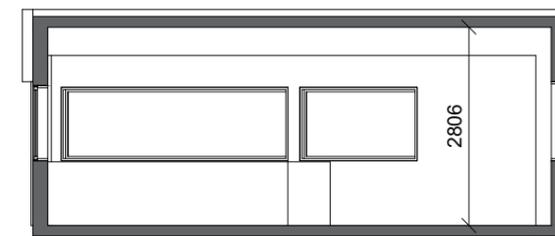
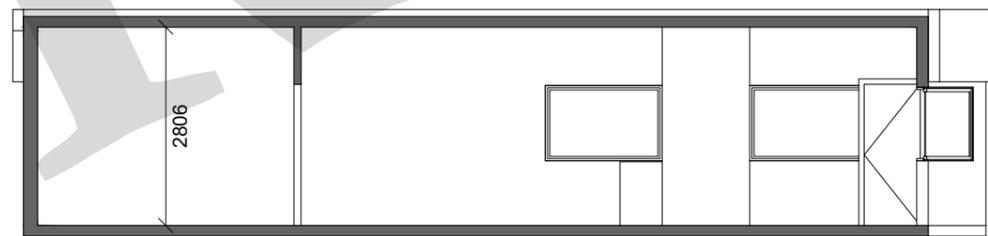
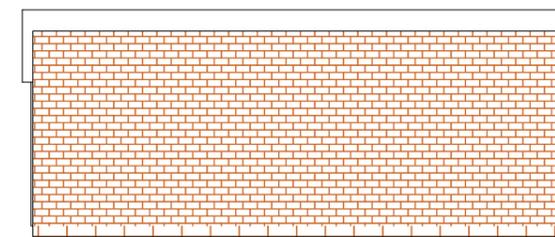
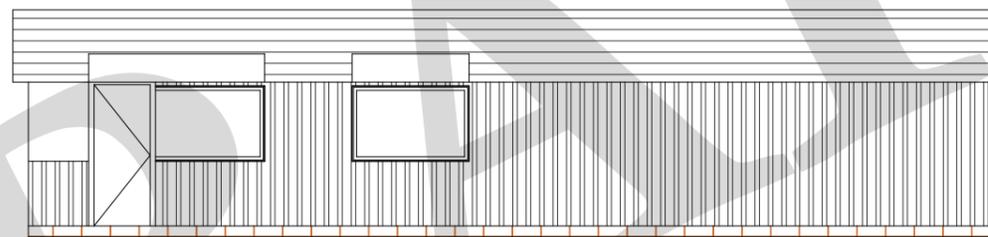
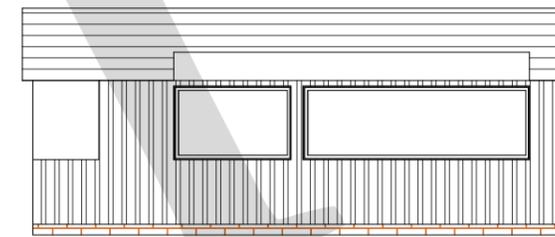
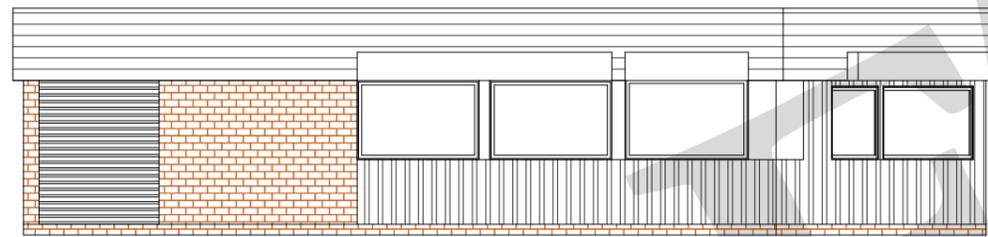
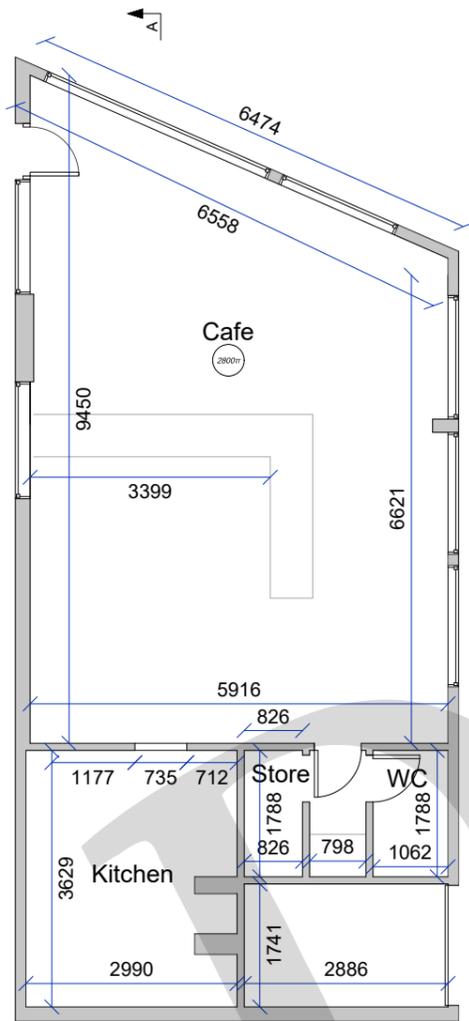
Client: Teas Me Cafe **Checked:**

Date: 04-01-2023 **Paper:** A3

Drawing No: HAD3462-01 **Scale:** 1:1250, 1:500

Revision:

No.	Description



Notes:
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Revisions List:

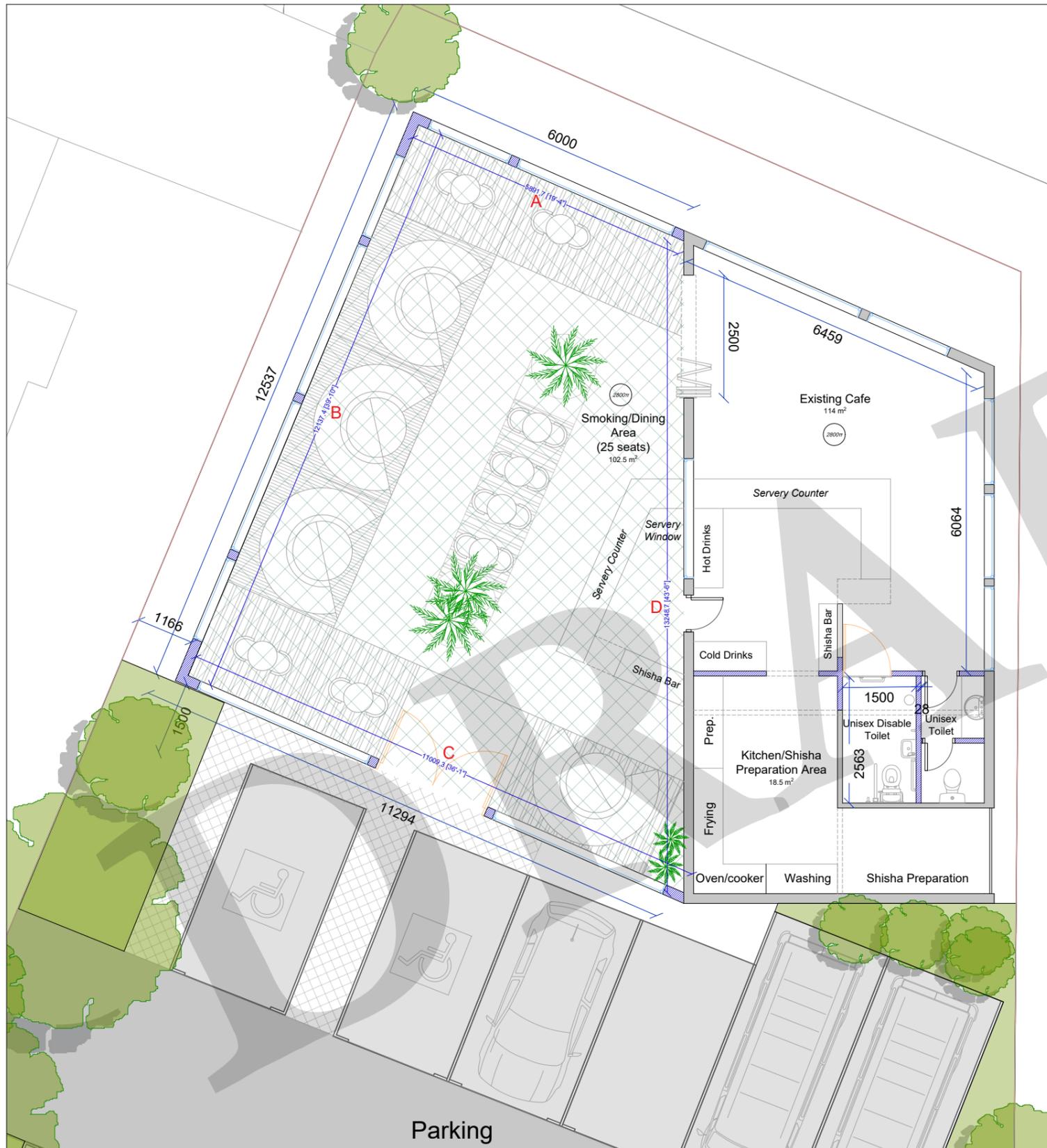
No.	Description	Date



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Address: Teas Me Cafe,
 6 Albert St,
 Lockwood,
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 HD1 3PR

Title: Existing Plans & Elevations	Drawn: HN
Client: Tea's Me Cafe	Checked:
Date: 27-12-2022	Paper: A3
Drawing No: HAD3462-02	Scale: 1:100
Revision:	



Proposed Ground Floor Plan 1:100 @ A3

Notes:
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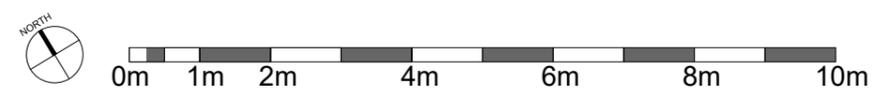
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Wall Area Calculation				
Wall Name	Wall Width [m]	Wall Height [m]	Wall Area [m²]	Percent
A	5.9	2.8	16.52	
B	12.1	2.8	33.88	
C	11	2.8	30.80	
D	13.2	2.8	36.96	
Total Wall Area			118.16	[100%]
Overall Open Air Required			60.26	[51%]

Open Air Area Calculation				
Wall Name	Wall Width [m]	Wall Height [m]	Wall Area [m²]	Percent
A	0.6	2.8	1.68	
B	12.1	1	12.10	
B	2	2.8	5.60	
C	0.8	2.8	2.24	
D	7.5	2.8	21.00	
Total Wall Excluding Open Air:			42.62	[36.06%]
Total Open Air:			75.54	[63.9%]

Walls Calculations



Revisions List:

Revision	Description

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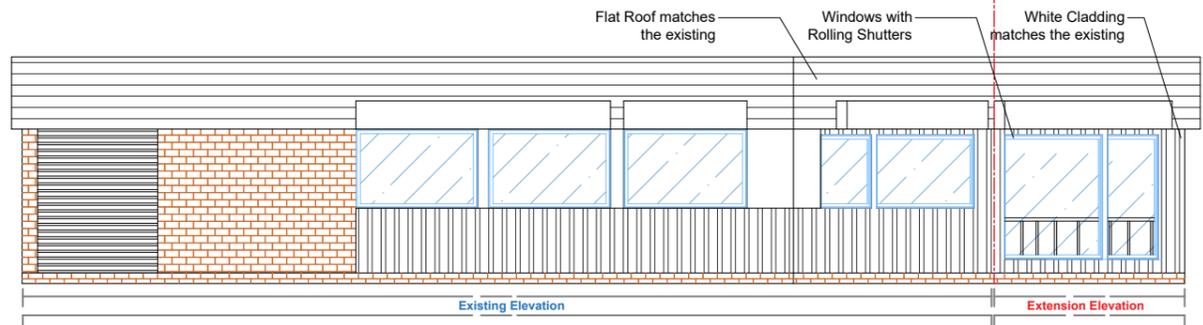
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Drawn: HN

Client: Tea's Me Cafe
Checked:

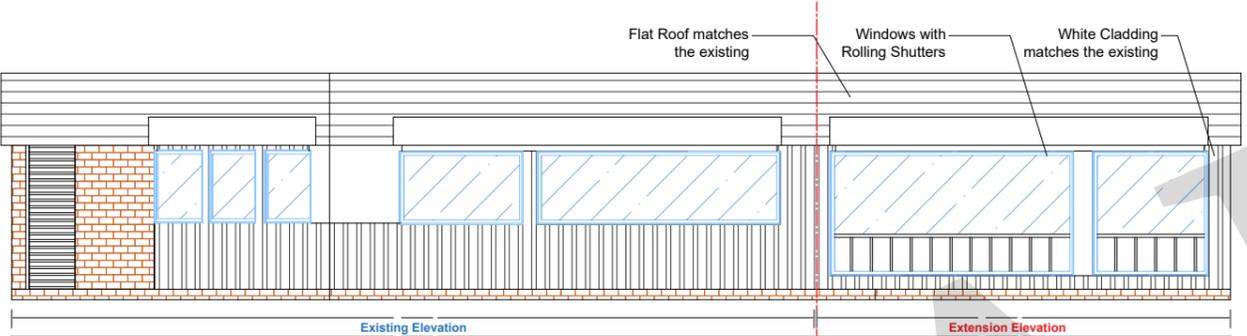
Date: 17-01-2023
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Scale: 1:100

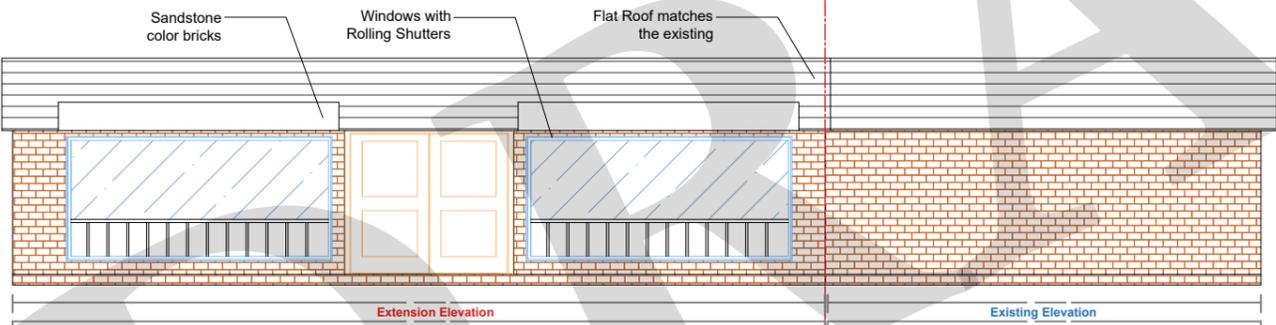
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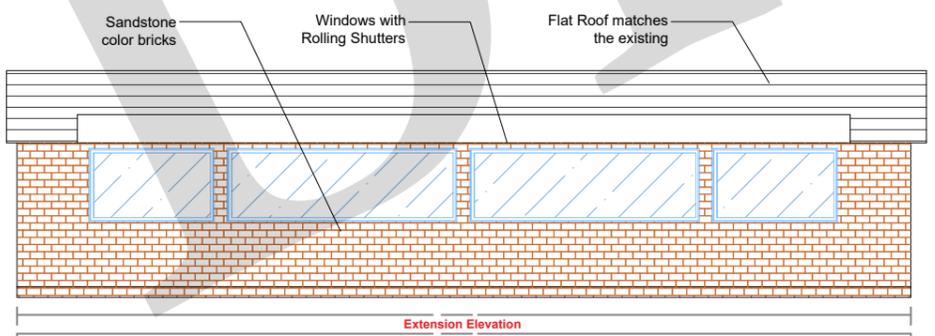
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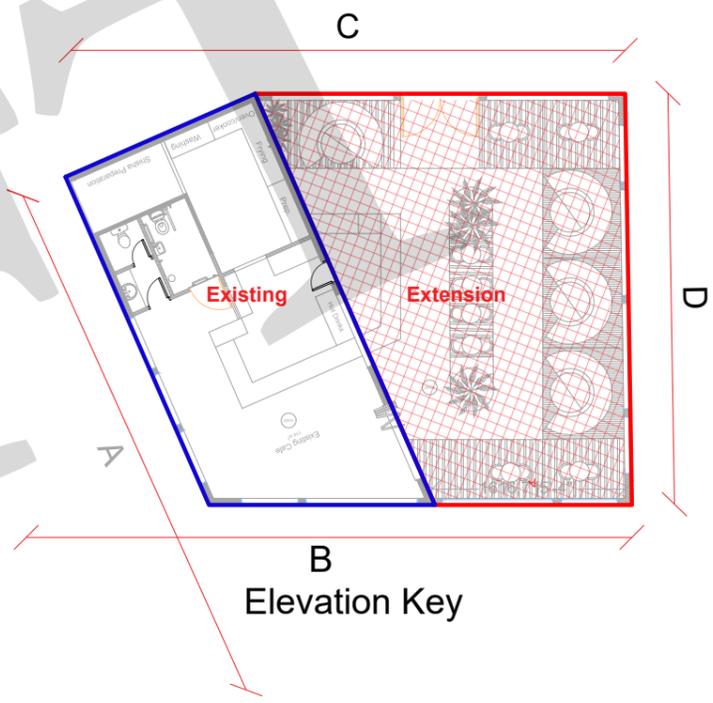
Proposed Side Elevation (B)



Proposed Side Elevation (C)



Proposed Rear Elevation (D)



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Revisions List:

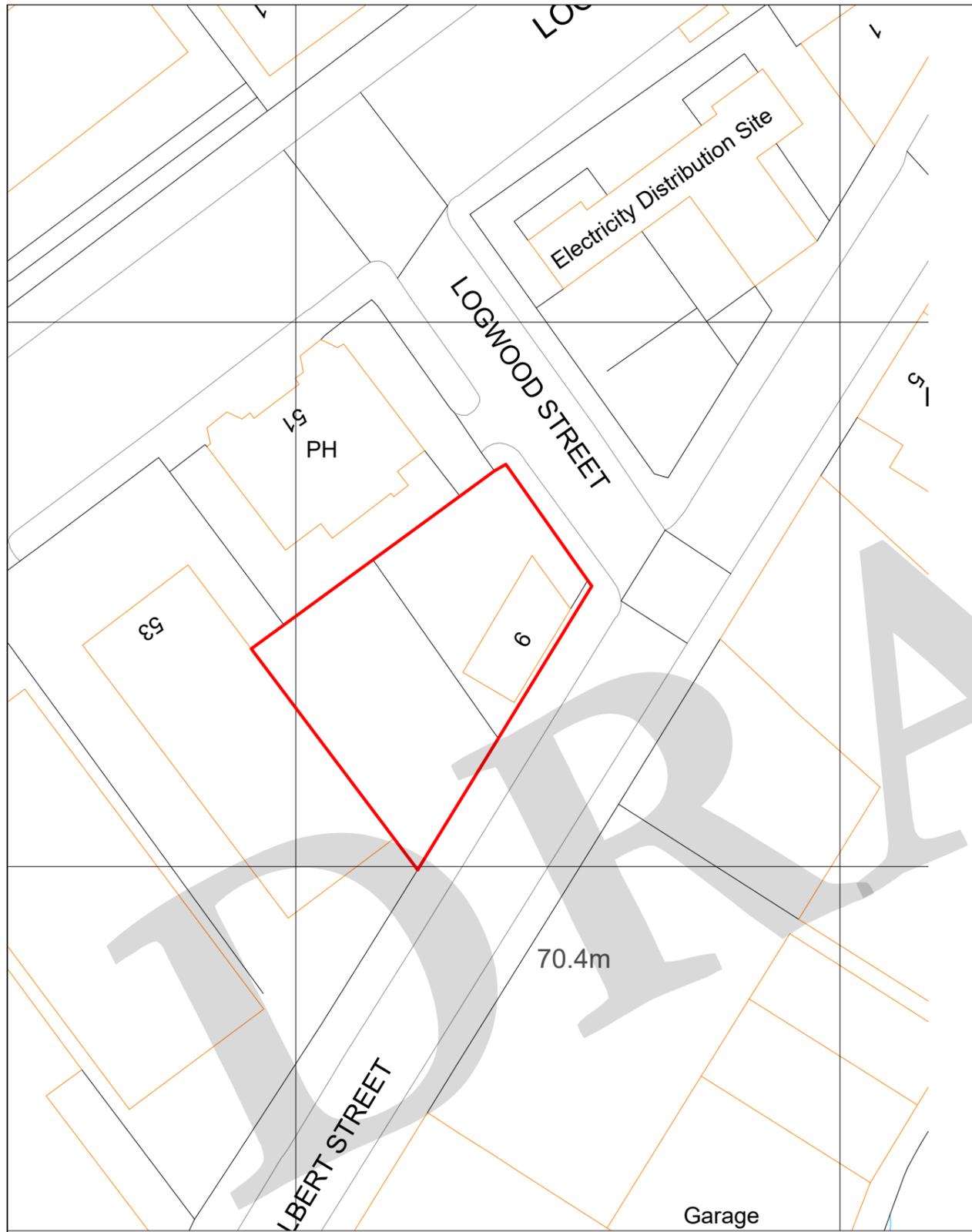
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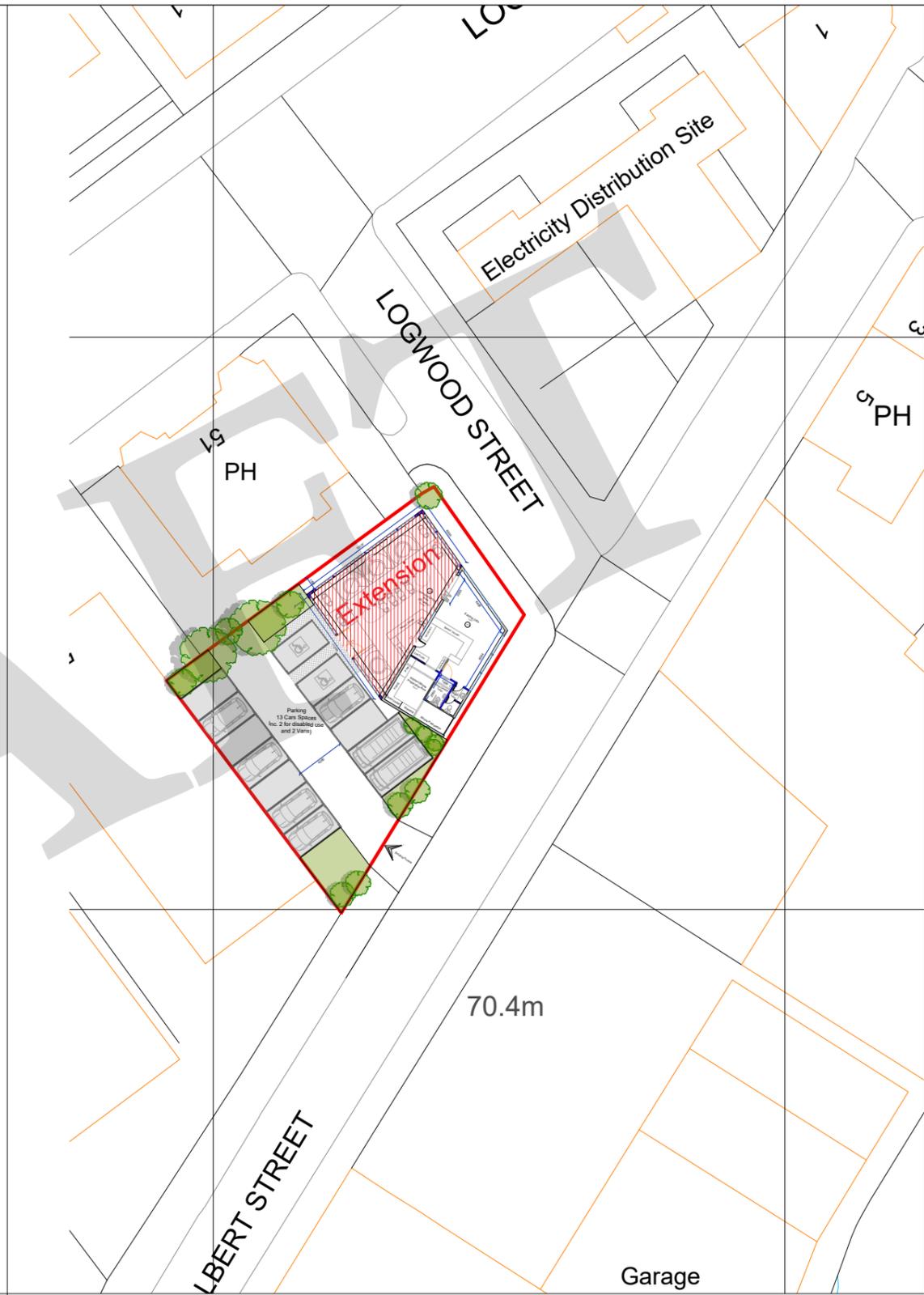
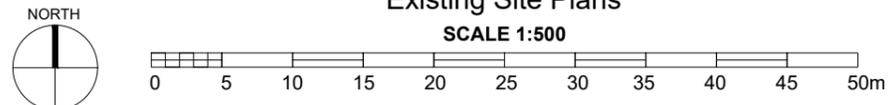
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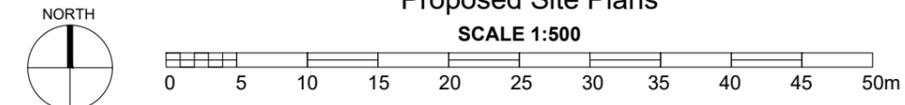
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Client: Teas Me Cafe	Checked:
Date: 17-01-2023	Paper: A3
Drawing No: HAD3462-04	Scale: 1:100
Revision:	



Existing Site Plans



Proposed Site Plans



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Revisions List:

No.	Description	Date



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Title: Existing and Proposed Site Plans **Drawn:** HA

Client: Teas Me Cafe **Checked:**

Date: 17-01-2023 **Paper:** A3

Drawing No: HAD3462-06 **Scale:** 1:500

Revision:

No.	Description

Appendix B: Yorkshire Water Asset Records

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.

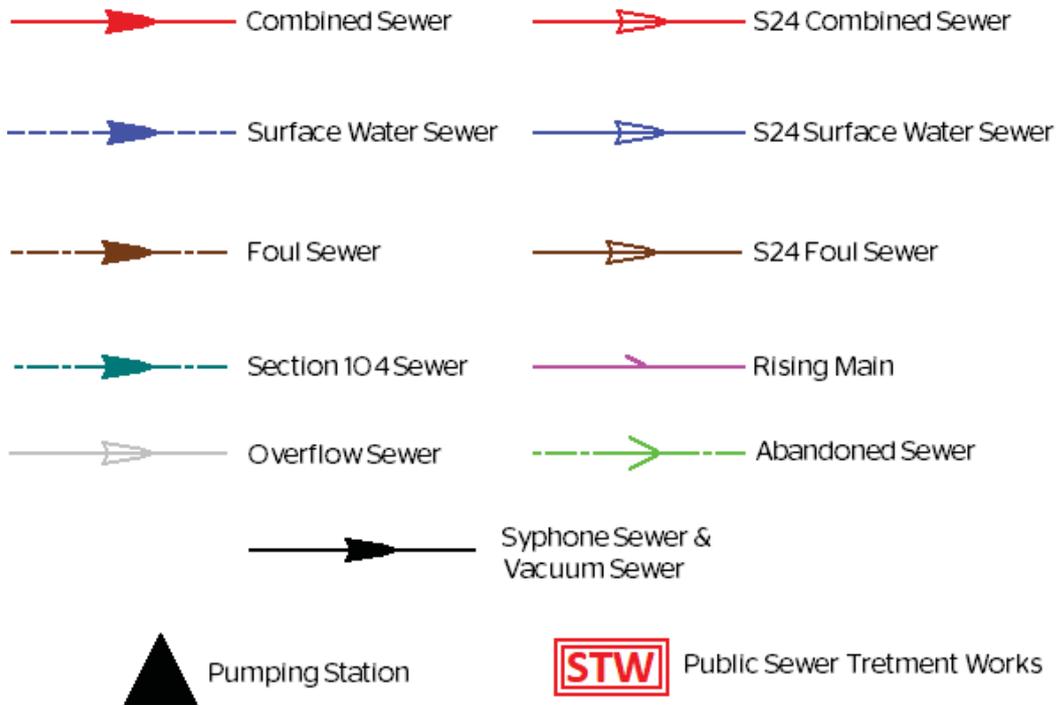
Private pumping stations will also transfer during the period 1 October 2011 – 1 Oct 2016. Records of these assets may not yet be shown on the existing mains record drawing(s). If you encounter any of these assets you must inform Yorkshire Water Services Ltd (YWS).

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

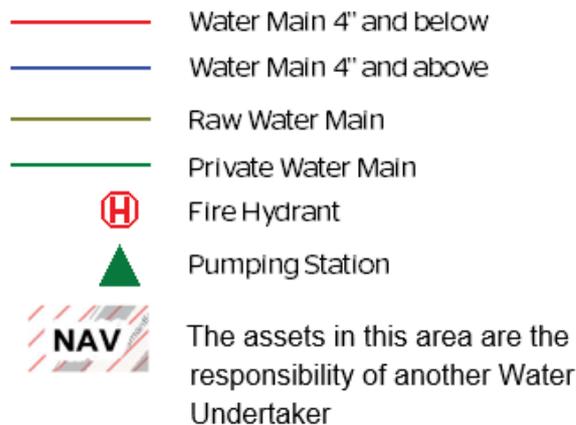


Sewer Legend



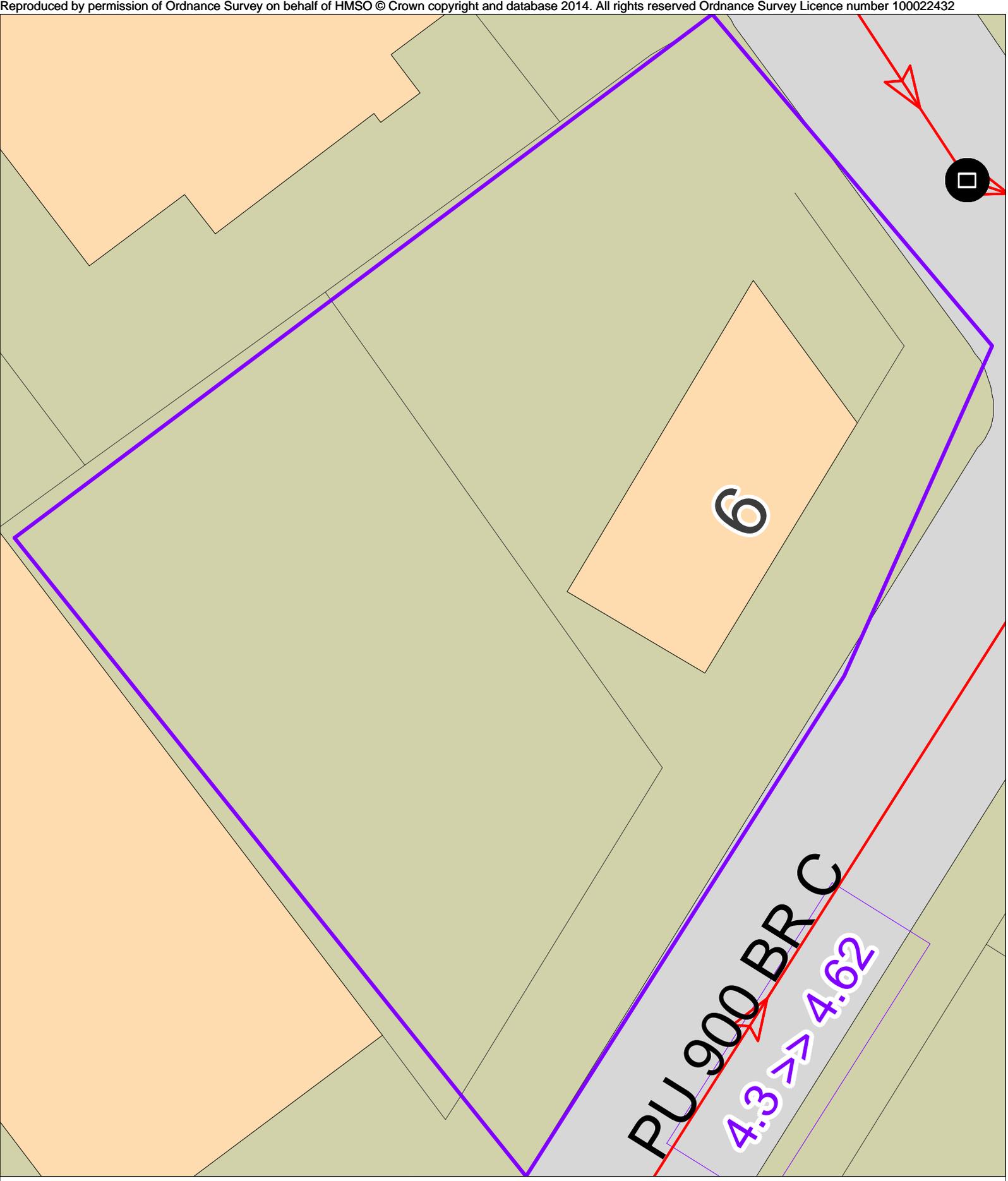
Please note that the direction of flow arrows may not always appear depending on the scale of the map.

Water Legend





Public Clean Water Network 15/03/2023 18:08:36 OS Grid Coordinates: 414078 : 415714 Map Name : SE1415NW svcGISSafeMovePD



Public Waste Water Network 15/03/2023 18:08:37 OS Grid Coordinates: 414078 : 415714 Map Name : SE1415NW svcGISSafeMovePD