

SuDSmart Plus



Sustainable Drainage Assessment

Site Address

Unicorn House
Cheetham Road
Middleton
Manchester
M24 4DG

Date

2024-09-23

Report Status

FINAL

Site Area

0.1 ha

Report Reference

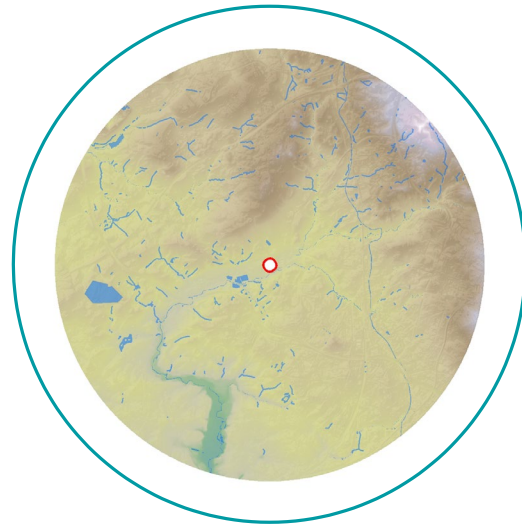
83402R1

Grid Reference

386561, 405628

Report Prepared for

Signature Estates



Infiltrate to Ground

The proposed Sustainable Drainage Scheme (SuDS) strategy is comprised of a rainwater harvesting butt, permeable paving and an attenuation tank to attenuate surface water runoff during the 1 in 100 plus 45% climate change event.

Surface water will infiltrate to ground via a soakaway and permeable paving, following confirmation of the ground conditions via infiltration testing in accordance with BRE 365 guidelines.

Foul water will continue to discharge via the existing connection to the public sewer network.

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1 Executive summary



This report assesses the feasibility of a range of Sustainable Drainage Scheme (SuDS) options in support of the Site development process. A SuDS strategy is proposed to ensure surface water runoff can be managed effectively over the lifetime of the development.

SuDS suitability

Risk	Issue	Result
Discharge Location	What is the infiltration potential at the Site?	High
	What is the potential to discharge to surface water features?	Low
	What is the potential to discharge to sewers?	High
	What is the potential to discharge to highway drains?	Low
Flooding	What is the river (fluvial) flood risk at the Site?	Very Low
	What is the surface water (pluvial) flood risk at the Site?	Very Low to Low
	What is the groundwater flood risk at the Site?	Negligible
Pollution	Is the groundwater a protected resource?	No
	Is the surface water feature a protected resource?	N/A

Summary of existing and proposed development

The Site is currently vacant, but was previously used within a commercial capacity as a gym. At present there is a single, two storey building with a car park and landscaped areas. Development proposals comprise the change of use and reconfiguration of the internal structure to a new residential building comprising of 11 apartments.

Summary of discharge routes

GeoSmart's SuDS Infiltration Potential (SD50) map indicates the Site has a High potential for infiltration, primarily due to the high permeability of the underlying geology (clay, silt, sand and gravel underlain by mudstone, siltstone and sandstone). Infiltration to ground is therefore likely to be feasible.

Ordnance Survey (OS) mapping indicates that there are no surface water features within 100 m of the Site. Therefore, discharge to surface water feature is not feasible.

The asset location plan search included in Appendix C confirms the Site is located adjacent to the public sewer network. Due to the short distance to nearby sewers discharging surface water runoff to the public combined sewer is feasible.

Runoff rate and attenuation requirements

Discharging via infiltration requires 38.80 m³ of attenuation to be provided to ensure there is no flooding as a result of the development in all storm events up to and including the 1 in 100 year including a 45% allowance for climate change. This volume is subject to the results of infiltration testing and would ensure runoff is not increased above the greenfield scenario.

Proposed SuDS strategy

SuDS features comprised of rainwater harvesting, permeable paving and a soakaway are proposed to attenuate a minimum of 41.04 m³ of surface water runoff. The SuDS features would provide some water quality benefits (interception and filtration) prior to infiltrating to ground. Focused infiltration features should be sited at least 5 m from building foundations and 2-3 m from adjacent highways.

The proposed SuDS strategy would ensure surface water runoff is stored on-Site in SuDS features for the 1 in 100 year event including a 45% allowance for climate change and will not cause flooding to the proposed development in accordance with DEFRA's non-statutory technical standards (DEFRA, 2015).

SuDS & drainage network maintenance

The management and maintenance of the SuDS features, in line with the details and schedules outlined in Section 10 of this report, will be undertaken by contractors appointed by the owners and occupiers of the new residential building, where payments for the works will form part of the property deeds and / or rental agreements.

Recommendations / Next steps

A site investigation is required to confirm the infiltration capacity of the ground in line with BRE 365 guidelines to confirm the infiltration rate and the groundwater level.

Where site investigation confirms the underlying ground conditions are not conducive to infiltration, the capacity of the public sewer network should be confirmed with the utility provider and permission to connect gained where required.

2 Proposed SuDS strategy



The most suitable SuDS options are outlined below and a SuDS strategy schematic is shown overleaf. Supporting information is provided in subsequent sections.

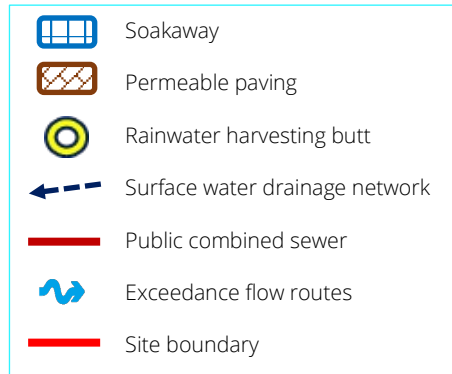
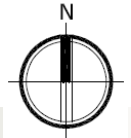
Table 1. Proposed SuDS type, features, discharge location and rate restriction

SuDS type	Source control (interception) and infiltration SuDS.
SuDS features	Rainwater harvesting, permeable paving and soakaway.
Discharge location	Infiltration.
Discharge rate	1×10^{-5} m/s (an example infiltration rate for clayey silty sand, in accordance with the CIRIA SuDS Manual (C753) (2015), to be confirmed via infiltration testing).

Table 2. Proposed SuDS sizing (dimensions) and attenuation volumes

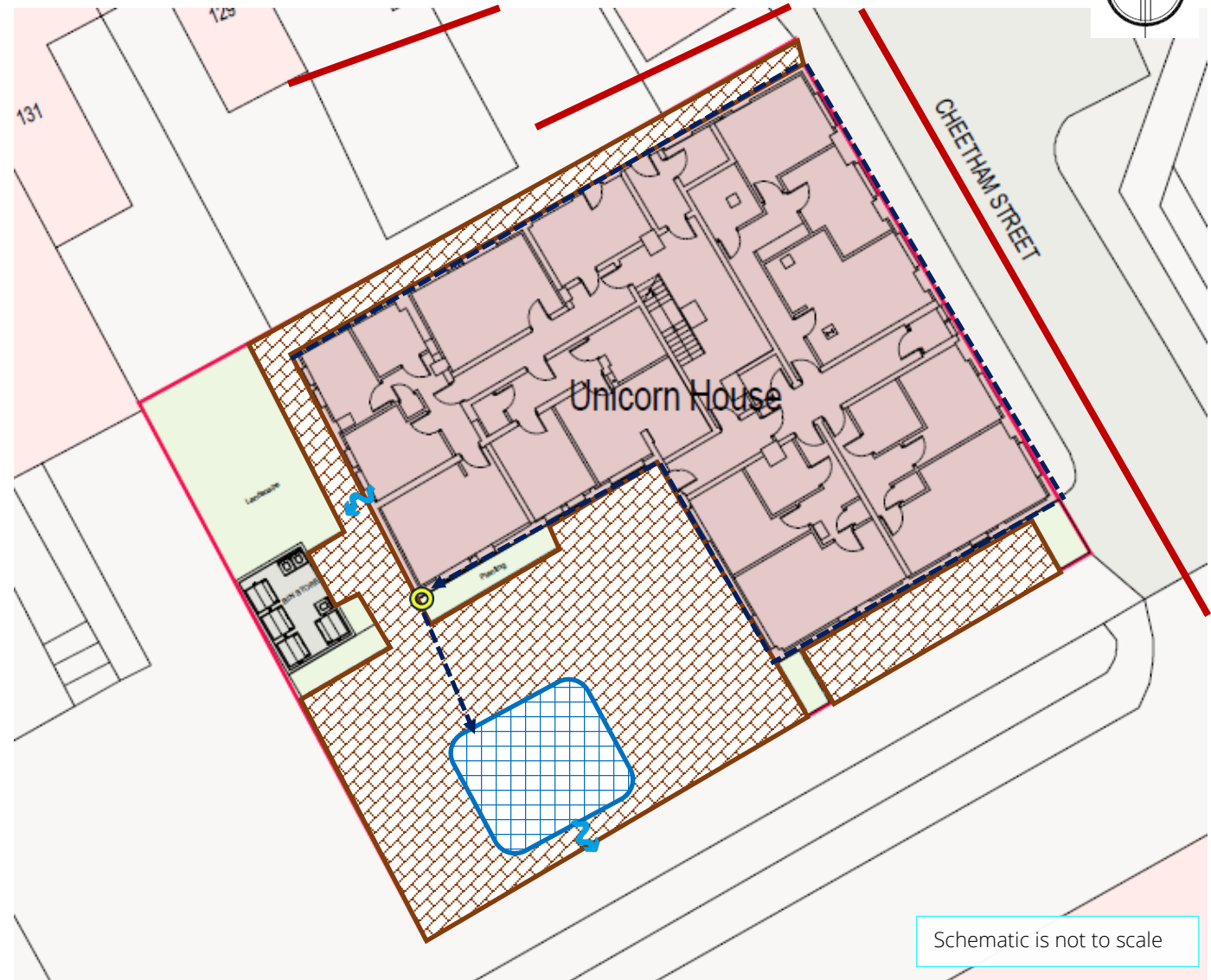
Rainwater Harvesting	In terms of attenuation storage within this SuDS scheme, the volume of run-off which could be attenuated by rainwater harvesting has not been considered within the Preliminary SuDS strategy.
Permeable Paving	A 319 m ² area of permeable paving (underlain with a Type 3 aggregate material) within the proposed driveway and parking areas to a depth of 0.66 m, with a 30% porosity.
Soakaway	A soakaway located in the parking area to the rear of the property with dimensions 6 m x 6 m x 1.20 m and a porosity of 95% will attenuate a minimum of 41.04 m ³ . The soakaway should be located 5 m from built foundations and 2-3 m from the adjacent road network.
Total Attenuation Provided	41.04 m ³
Total Attenuation Required	38.80 m ³
Freeboard Storage Provided	2.24 m ³

Figure 1. Proposed SuDS scheme



Surface water from the roof of the proposed development should be conveyed into the permeable paving and rainwater harvesting butt, then into the soakaway for infiltration to the ground.

Exceedance flows are directed towards non-essential, landscaped areas on Site.



Schematic is not to scale

3 Site analysis

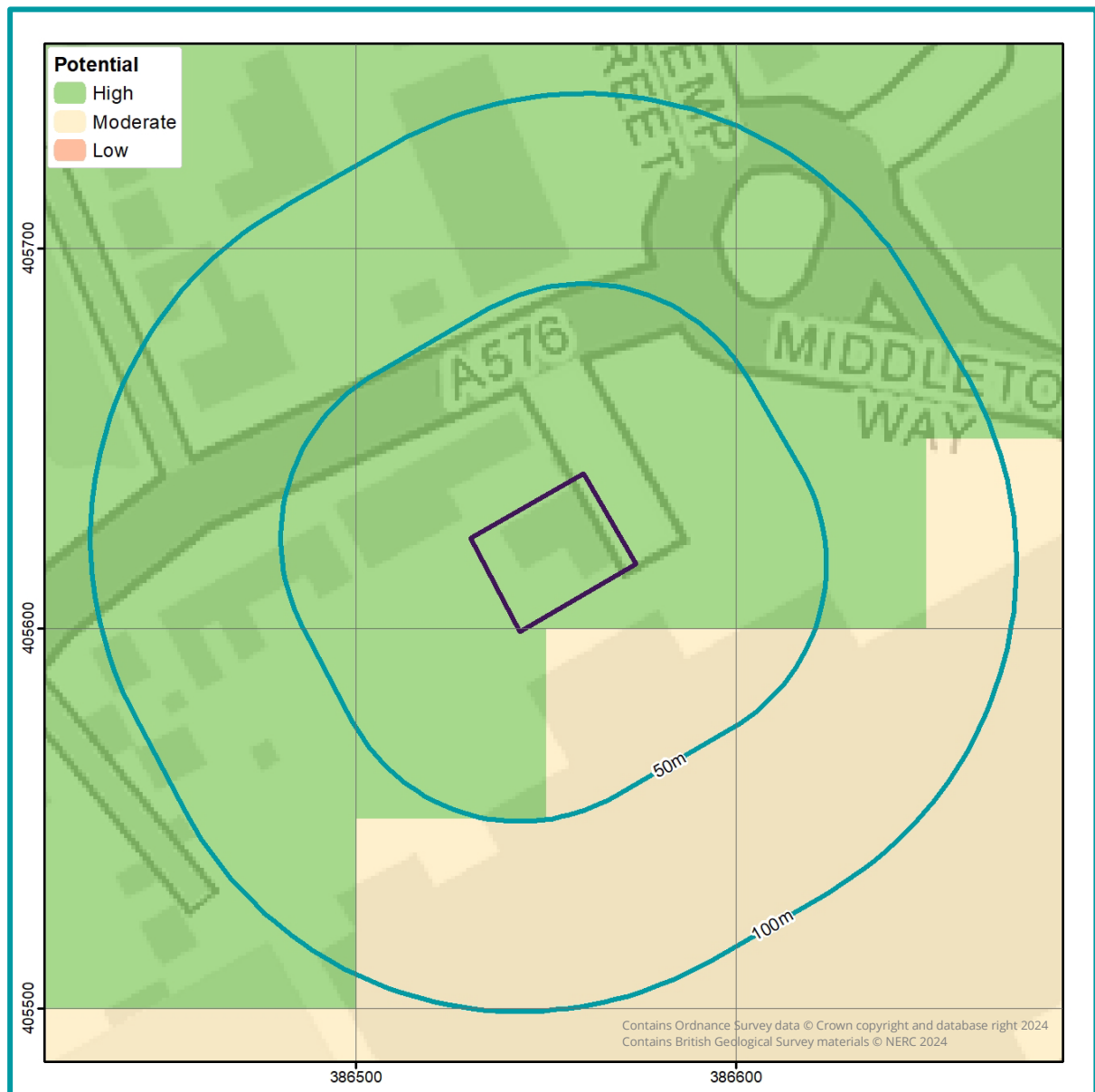


Site location

Figure 2. Aerial Imagery (Bluesky, 2024)



Figure 3. SuDS infiltration suitability (SD50) map (GeoSmart, 2024)



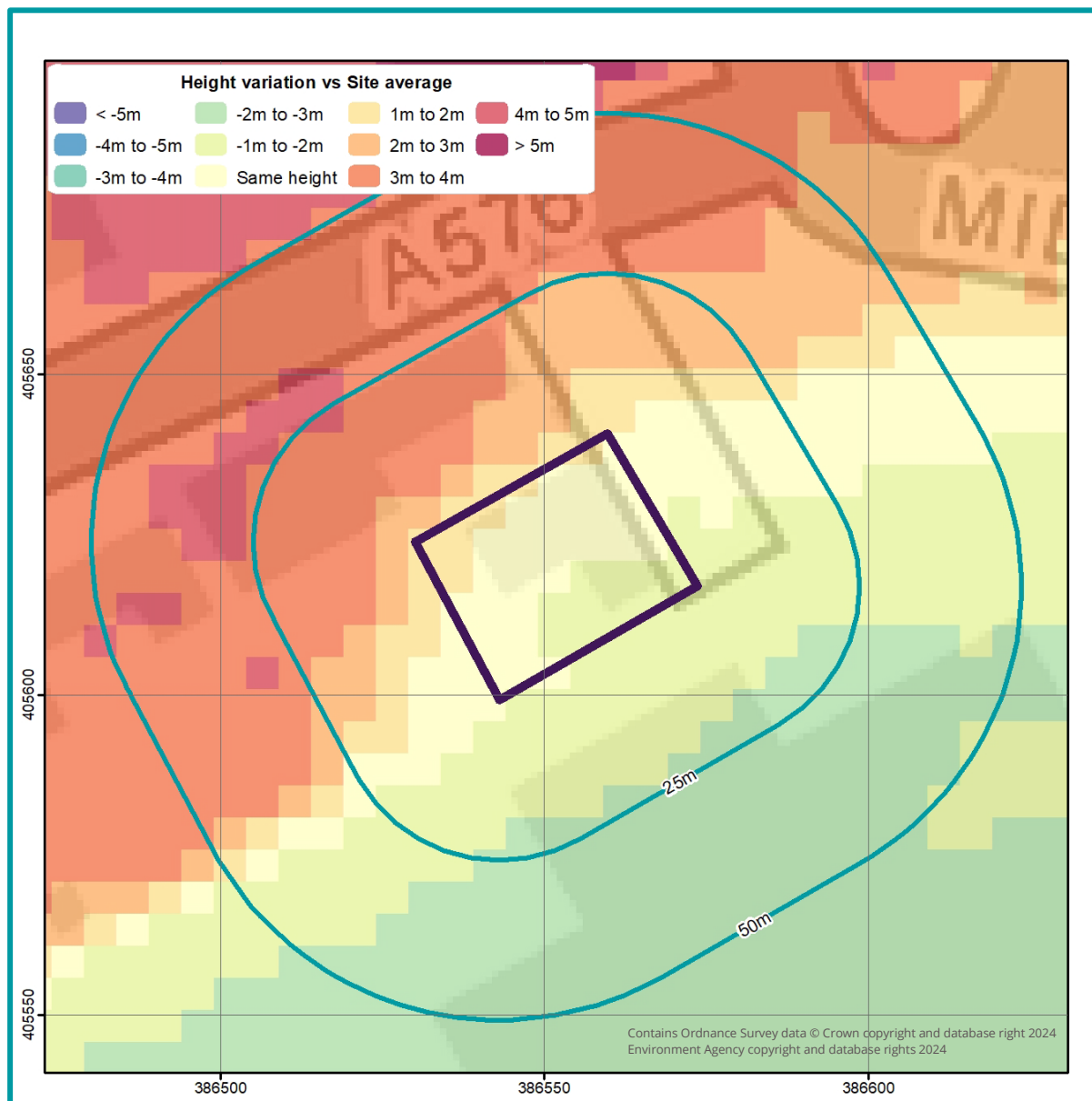
The GeoSmart SuDS Infiltration Suitability Map (SD50) screens the potential for infiltration drainage at the Site and indicates where further assessment is recommended. The map combines information on the thickness and permeability of the underlying material and the depth to the high groundwater table. It supports conceptual Site drainage design and the planning of further Site investigation.

There is a High potential for infiltration SuDS across the Site. It is likely that the underlying geology at the Site has high permeability and an infiltration SuDS scheme should be possible at the Site.

Groundwater levels are expected to be sufficiently deep at the Site. However, a Site Investigation is recommended to confirm the infiltration capacity and the depth to

groundwater. Various options can be considered for infiltration SuDS and these include infiltration trenches, soakaways, swales and permeable pavements.

Figure 4. Site topography (GeoSmart, 2024)



An assessment of the topography at the Site has been undertaken using LiDAR DTM5 elevation data to identify the general slope and any localised depressions. The mapping shows a comparison between average ground levels on the Site with ground levels in the surrounding area. The mapping confirms the overall Site is generally steeply sloping to the south east.

Further analysis could be undertaken by visiting the Site or by collecting additional topographic survey to provide further confirmation of ground levels.

Figure 5. Source protection zone map (EA, 2024)



An assessment of the EA's groundwater Source Protection Zones (SPZs) has been undertaken within the vicinity of the Site and confirms the Site is not located within an SPZ.

Infiltration, if possible, is likely to be acceptable providing risk screening identifies suitable mitigation measures, if required, to prevent an impact on water quality from the proposed or historical land use and contaminated land.

If further analysis is required, this would involve a review of Site specific contaminated land data. If hazards are identified, it is recommended that the Local Authority and the Environment Agency are contacted to confirm the susceptibility of any SPZs within the wider area.

Figure 6. Surface water features map (EA, 2024)



Ordnance Survey (OS) mapping indicates that there are no surface water features within 100 m of the Site. Therefore, discharge to surface water feature is not feasible.

According to DEFRA's Magic Map, the Site is not within 250m of a SSSI or SPA.

Further analysis could be undertaken by visiting the Site or by contacting the Local Council and the Environment Agency (EA) to confirm the presence, location and condition of any mapped or additional unmapped surface water features.

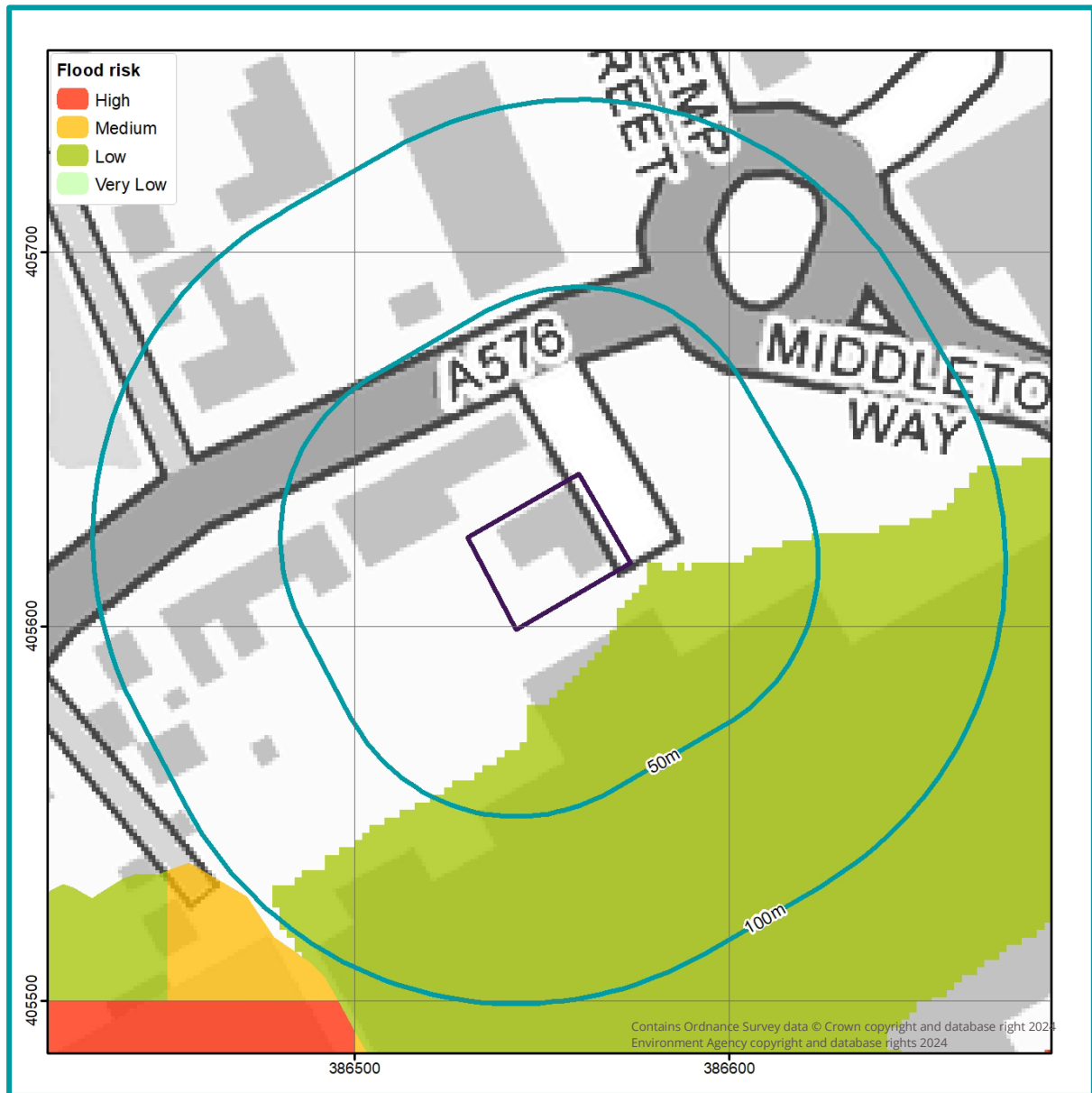
Figure 7. Sewer features map (OS & United Utilities, 2024)



GeoSmart has undertaken an assessment of the location of sewer features within the vicinity of the Site. There is a public combined sewer located adjacent to the northern and eastern boundaries of the Site; therefore, discharge to sewer is likely to be appropriate.

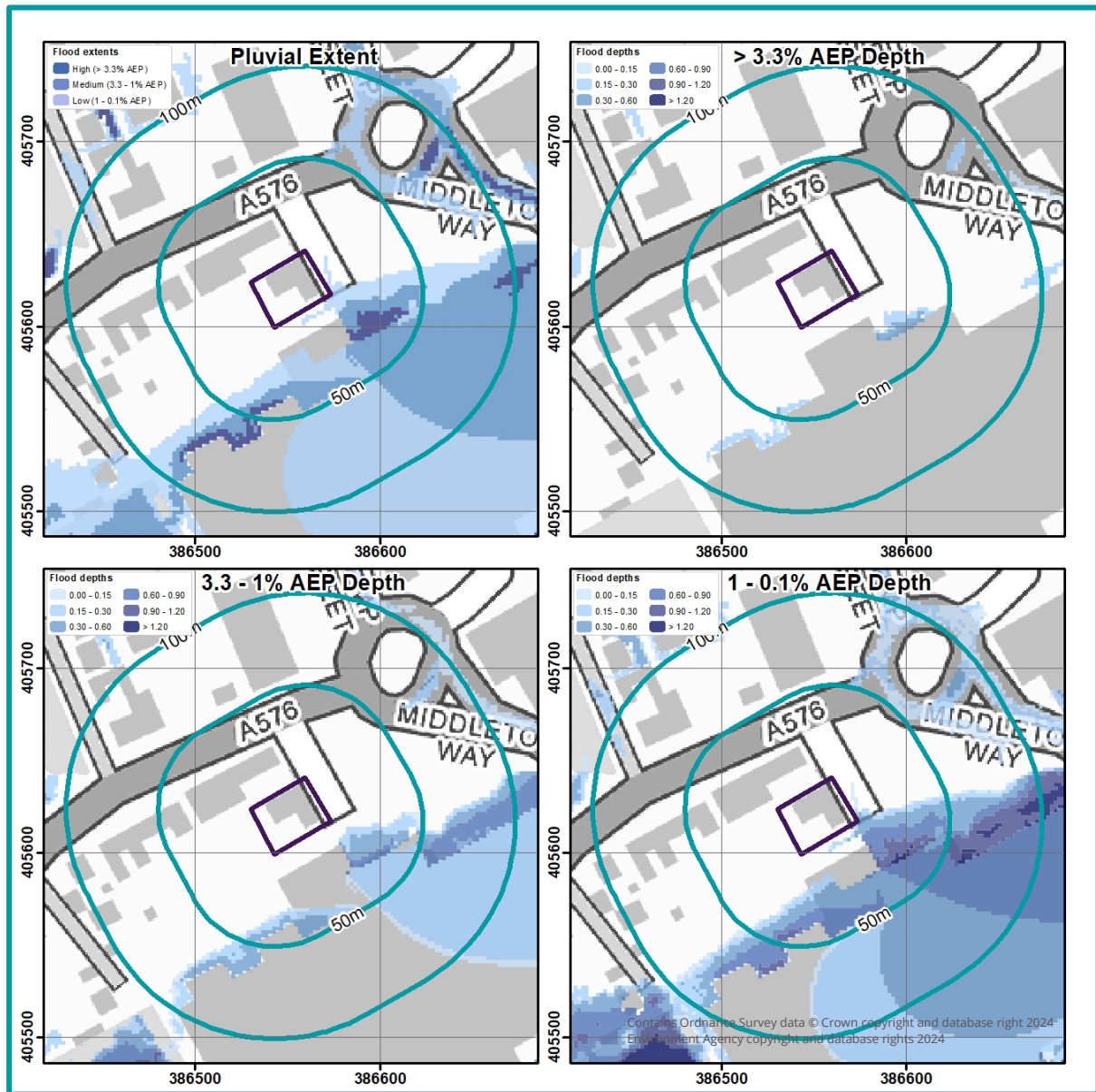
Further analysis of the connections and condition of the public surface water drainage system should be undertaken by carrying out a CCTV survey or by contacting the drainage provider or the Local Council to confirm the presence, location and condition of the sewer. Consultation with the drainage provider would also be required to determine that sufficient capacity is available to accept the proposed discharge, and to gain permission to connect if required.

Figure 8. Risk of flooding from rivers & sea map (EA, 2024)



According to the EA's Risk of Flooding from Rivers and the Sea (RoFRS) map, the Site has a Very Low risk of flooding from fluvial or coastal flooding, with less than 0.1% annual probability of flooding. Therefore, the SuDS design is unlikely to be affected.

Figure 9. Risk of surface water flooding map (EA,2024)



GeoSmart have undertaken an assessment of the risk of flooding from surface water (pluvial) sources within the vicinity of the Site using the EA's Risk of Flooding from Surface Water (RoFSW) mapping. The EA's mapping confirms the Site is considered to be at Very Low to Low risk of surface water flooding.

The above map shows the extent and depth of flooding during the >3.3% annual probability (AEP) (1 in 30 year – High risk), 3.3 – 1% AEP (1 in 100 year – Medium risk) and 1 – 0.1% AEP (1 in 1000 year – Low risk) events. This confirms that the majority of the Site would not be affected by surface water flooding, with the exception of an approximately 3 m² area where pluvial flooding could occur in a 1 in 1000 year event. This small area of flooding may constrain certain types of SuDS features being used in this part of the Site.

Further analysis could be undertaken by visiting the Site or by contacting the Local Council and the Environment Agency to confirm the pluvial flood risk, flood depths and velocities where applicable.

Figure 10. Groundwater flood risk (GW5) map (GeoSmart, 2024)



GeoSmart have undertaken an assessment of the risk of flooding from groundwater within the vicinity of the Site. GeoSmart's Groundwater Flood Risk Screening (GW5) map confirms the Site has a Negligible risk of groundwater flooding during a 1% annual probability (1 in 100 year) event.

4 Site context



Site information

The purpose of this report is to assess the potential for disposing of surface water through a Sustainable Drainage System (SuDS) for the site of Unicorn House, Cheetham Rd, Middleton, Manchester, M24 4DG (the Site). The Site is located within a suburb of Manchester in a setting of commercial and residential land use. The land slopes to the south east from 79.62 mAOD to 76.94 mAOD. This is based on EA elevation data obtained for the Site to a 1 m resolution with a vertical accuracy of ± 150 mm. Site plans and drawings are provided in Appendix A.

Development

The Site is currently vacant, but was previously used within a commercial capacity as a gym. At present there is a single, two storey building with a car park and landscaped areas. Development proposals comprise the change of use and reconfiguration of the internal structure to a new residential building comprising 11 apartments.

Geology, permeability and thickness

British Geological Survey (BGS) national superficial and bedrock geology mapping confirms the geological formations underlying the Site and each formation may have a range of permeability.

Table 3. Site Geology

Geology present on-Site		Potentially permeable?
Superficial geology (Figure 11)	Glaciofluvial Sheet Deposits, Devensian (GFSDD) – sand and gravel (found in the north of the Site) Alluvium (ALV) – clay, silt, sand and gravel (found along the southern boundary)	✓
Bedrock geology (Figure 12)	Pennine Lower Coal Measures Formation (PLCM) – mudstone, siltstone and sandstone	✓

The permeability of the underlying material at the Site shown within the BGS mapping is high. Confirmation of the infiltration capacity is required.

The BGS website was used to extract ground information from the nearest borehole records to the Site (ref: SD80NE21 and SD80NE13). These boreholes are located approximately 100

m to the southeast and 140 m to the north of the Site at an elevation of 73.2 mAOD and 82.3 mAOD.

Despite being located within areas of different superficial deposits (SD80NE13 on GFSD and SD80NE21 on ALV), borehole records indicate similar underlying geology. They confirm that the underlying geology is comprised of sand, gravel and clay layers to a depth of between 32 m and 35.66 m below ground level (bgl) underlain by shales and rock to a depth of between 124.36 m and 91.44 m bgl at core completion.

Infiltration SuDs are proposed directly into permeable superficial deposits.

The soil infiltration coefficient must be sufficient to accommodate the constraints on the dimensions of the soakaway and its emptying time.

Depth to groundwater

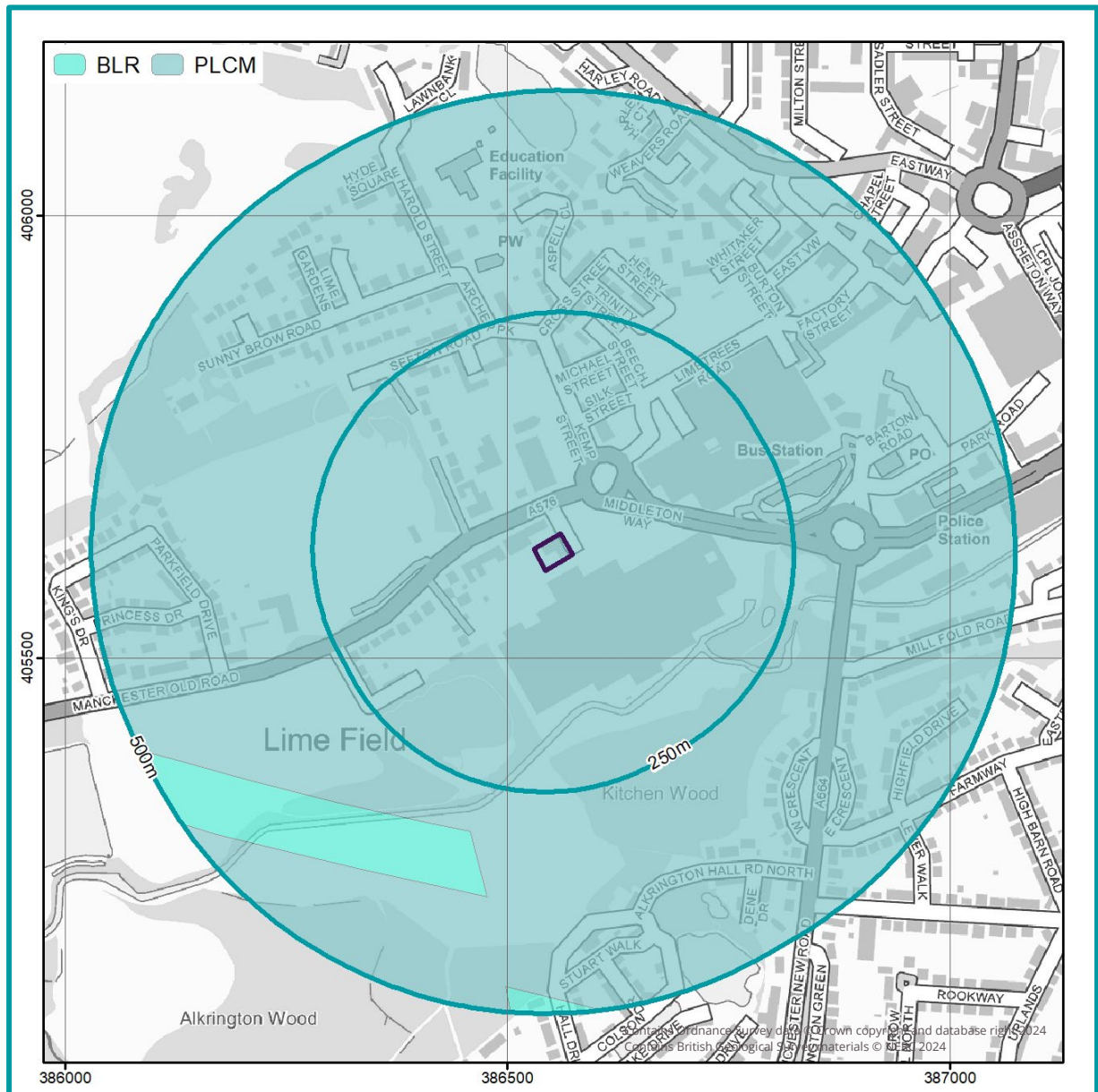
The SuDS system should be designed to operate in periods of extreme groundwater levels.

Borehole records indicate groundwater levels may be around 13.72 mbgl (ref: SD80NE13) within the permeable superficial geology.

According to borehole data and GeoSmart's Groundwater Flood Risk (GW5) map, shallow groundwater is unlikely to be an issue at the Site.

The base of the infiltration system needs to be 1 m above the expected seasonal high-water table. Passage through unsaturated soil is important for improving the quality of infiltrating water before it reaches the water table.

Figure 12. Bedrock Geology (BGS, 2024)



Ground conditions

Infiltration SuDS are proposed within permeable superficial deposits containing sand, therefore a detailed review of underlying ground conditions is recommended to ensure focused infiltration does not cause ground instability as a result of landslide or collapse associated with running sand.

Soakaways should be a minimum of 5 m away from the foundations of a building and local guidance may recommend a greater distance, such as 10 m on some areas of the Chalk.

Water quality

The Site does not lie within an SPZ. The infiltrated water quality should be of sufficient quality that it does not give rise to pollution of the underlying groundwater. Further consultation with the water company is unlikely to be required.

Infiltration systems should not be used where there is a risk of contaminating groundwater by infiltrating polluted runoff or where receiving groundwater is particularly sensitive.

The influence of surface runoff on water quality will depend on whether there is a source of contamination on-Site and the sensitivity of the receiving environment, either groundwater or surface water. The intervening pathway from source to receptor including mitigation and natural attenuation will determine the final impact.

The impact of contaminants on the groundwater will be reduced by travel and natural attenuation through the unsaturated soil zone. A greater depth of unsaturated zone and the presence of significant clay and organic material will provide greater protection for the underlying groundwater. Rapid flow through fractures will provide less protection than intergranular flow around soil and rock particles.

5 National & local policy context



National Guidance

CIRIA SuDS Manual (C753) (2015)

A development should utilise sustainable drainage systems (SUDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the following drainage hierarchy:

1. Use infiltration techniques, such as porous surfaces in non-clay areas,
2. attenuate rainwater in ponds or open water features for gradual release,
3. attenuate rainwater by storing in tanks or sealed water features for gradual release,
4. discharge rainwater direct to a watercourse,
5. discharge rainwater to a surface water sewer / drain,
6. discharge rainwater to the combined sewer.

Defra - Sustainable Drainage Systems: Non-statutory technical standards for sustainable drainage systems (2015)

Peak Flow control

For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.

For greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should never exceed the peak greenfield runoff rate for the same event.

Volume control

Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event. The runoff volume must be discharged at a rate that does not adversely affect flood risk.

The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the Site for a 1 in 30 year rainfall event.

Ministry of Housing, Communities & Local Government – National Planning Practice Guidance: Flood risk assessments: climate change allowances (2022)

The Peak rainfall intensity allowances section provides advice on the increased rainfall effects on river levels and land and urban drainage systems. As of May 2022, the applicable climate change allowance is defined by specific Management Catchment for the 1 in 30 ($\geq 3.3\%$ AEP) and 1 in 100 (< 3.3 to 1% AEP) year event.

As the Site is located within the Irwell Management Catchment the following climate change allowances are applicable.

Table 4. Irwell Management Catchment peak rainfall allowances

Irwell Management Catchment	3.3% Annual exceedance rainfall event		1% Annual exceedance rainfall event	
	2050s	2070s	2050s	2070s
Central	25%	30%	25%	30%
Upper end	35%	40%	40%	45%

The drainage system should be designed to make sure there is no increase in the rate of runoff discharged from the Site for the upper end allowance.

Where on-Site flooding for the upper end allowance presents a significant flood hazard (for example, depths and velocities of surface water runoff cause a significant danger to people), you will need to take further mitigation measures to protect people and property (for example, raising finished floor levels). As a minimum, there should be no significant flood hazard to people from on-Site flooding for the central allowance.

Local Policy

Rochdale Local Plan Adopted Core Strategy (Rochdale Borough Council, 2016)

Policy G1 Tackling and adapting to climate change

We will address climate change and ensure growth does not increase CO₂ emissions by:

- Locating growth in areas which are likely to minimise the need for travel and which are well served by public transport, services and infrastructure;
- Expecting all development and regeneration schemes to be well connected to surrounding areas and facilities by sustainable means of transport (Policy T2);
- Encouraging and promoting renewable energy developments, including standalone and community developments, that do not, by virtue of their scale, siting, construction

or operation, cause harm to the local area, its character and environmental assets and adjoining uses, which cannot be satisfactorily mitigated (Policy G3);

- Promoting the efficient re-use of buildings, especially those of heritage value, and the recycling of construction waste;
- Ensuring that development does not cause unacceptable harm to the borough's peatlands and woodlands, and encouraging their restoration and responsible management;
- Promoting sustainable waste management through the operation of policies in the Core Strategy and Greater Manchester Joint Waste Plan;
- Making the best use of open space to contribute to climate change mitigation and adaptation; and
- Securing planning obligations for energy infrastructure and climate change adaptation measures.

New developments will be expected to:

- a. Be zero carbon in line with national targets and definitions;
- b. Adhere to the 'energy hierarchy' as outlined in policy G2, being designed in such a way that ensures that buildings require the minimum amount of energy to function over their lifetime;
- c. Reduce CO₂ emissions through the use of renewable and low carbon decentralised energy technologies and networks. This will be through both on-site provision in new developments and through connection to local networks;
- d. Address the impacts of climate change by incorporating comprehensive adaptation measures, including:
 - i. suitable measures, such as urban greening, for tackling the 'urban heat island' effect;
 - ii. where possible, the opening up of covered and culverted sections of waterways and provision of new water features, to help cooling and provide biodiversity, landscape and flood prevention benefits;
 - iii. the incorporation of appropriate water conservation and management measures, such as Sustainable Drainage Systems (SuDS), including ensuring that the rate of run-off on 'greenfield' sites is not increased and on 'brownfield' sites is significantly reduced, and avoiding the use of impermeable surfaces;
 - iv. the retention of existing trees wherever possible and the taking of all appropriate opportunities to plant trees and other suitable vegetation on site; and
 - v. the incorporation of 'green roofs' wherever possible, such as with flat roofs.

Policy G8 Managing water resources and flood risk

We will ensure that new development (including flood risk mitigation measures) does not lead to any form of increased flooding locally or further downstream, does not impede natural water and flood risk management, is not detrimental to existing or potential flood storage areas, contributes where possible to alleviating existing flood risk, is itself well protected from flood risk and ensures prudent use of water resources. We will require:

- a. Compliance with a 'sequential' approach to new development and flood risk, directing development away from areas of high risk, in accordance with the National Planning Policy Framework;
- b. Full regard to and compliance with the advice of the Environment Agency (or equivalent agency) and the objectives and priorities for flood risk management set out in the Local Flood Risk Management Strategy, including any mitigation measures recommended for particular sites;
- c. Full regard to the published evidence of local flood risk and its significance as included in Strategic Flood Risk Assessments, Surface Water Management Plans and other recognised sources of flood risk data and the production of additional Flood Risk Assessments (FRAs) as appropriate;
- d. Incorporation of appropriate measures for the management of surface and flood water, including flood storage areas, Sustainable Urban Drainage Systems (SUDS) and the protection of 'overland flow paths';
- e. Compliance with any Surface Water Management Plan or drainage strategies produced, such as for the identified critical drainage areas of Littleborough and Heywood;
- f. The avoidance of culverting, and support the opening up of existing culverts wherever possible;
- g. The incorporation of measures for the conservation of water to minimise potable water consumption, including rainwater collection measures, which should be integral to the design of buildings and spaces;
- h. Development that does not directly or indirectly lead to pollution of existing water resources such as watercourses and groundwater or the derogation of the quantity of groundwater;
- i. The incorporation of measures to improve water quality; and
- j. The taking of opportunities to improve the habitat value of watercourses and water bodies.

In addition, we will identify additional flood storage areas which will be protected from development.

Rochdale Borough's Strategy for Flood Risk Management 2014-2024 (Rochdale Metropolitan Borough Council, 2014)

Development and sustainable drainage

- Spatial planning aims to ensure development is sustainable and delivers social, economic and environmental benefits. Spatial planning whilst promoting development must also ensure the appropriate safeguarding and protection of the natural environment including agricultural land, biodiversity and land which helps to manage and protect our communities from current and future environmental risks such as those from climate change which includes for example our natural flood plains and other land which is important for managing current or future flood risks.
- One of the principal influences on flood risk is the impact of development. Development which is poorly located and designed may result in significant flood risk for its occupants or users and also significant disruption to its use e.g. for habitation or for work. There may also be downstream impacts. Development can also contribute to improved drainage and flood risk management where it is well located and incorporates or provides appropriate flood risk management measures based on a robust flood risk assessment. It is important that early advice is sought through the Local Planning Authority, the Environment Agency and others to help inform the location and design of development through pre-application discussions and use of available flood risk data which will inform more detailed site assessments, site selection and design.
- Rochdale borough's Core Strategy recognises the importance of good flood risk management and has taken account of existing studies for fluvial and surface water flooding and national planning policy in its production. The impact of flood risk in future Development Plan Documents such as relating to allocating land for categories of use will also take full account of flood risk management matters in terms of risk and also opportunities to better manage that risk in the future for example through flood water storage or other sustainable drainage measures. The Council will produce a Supplementary Planning Document setting out the Council's planning approach to flood risk management and the role of the Local Flood Risk Management Strategy in delivering sustainable development and land use.
- At the time of writing, guidance to support the establishment of a new system for managing surface water through sustainable drainage systems by April 2014 is awaited. The Flood and Water Management Act 2010 requires the establishment of a Sustainable Drainage Approval Body (SAB) which will receive applications for sustainable drainage proposals that require approval. This is a separate process from existing planning and building control approval processes but will need to relate to the timescales of these processes where appropriate as SAB approval will be required prior to development being able to commence.
- Sustainable drainage systems can include one or more of the following:

- permeable surfaces which allow water to infiltrate the ground or into underground drainage;
 - drainage ditches such as swales;
 - temporary storage basins which can be specific or have multiple open space functions outside of a flood event;
 - ponds; and
 - wetlands
- Sustainable drainage systems can help to manage pollution and also provide opportunities for biodiversity. Sustainable drainage systems can also provide opportunities to store and re-use water for a range of purposes for which 'grey' water is appropriate. It is important to ensure that appropriate sustainable drainage approaches are introduced based on proper consideration of factors such as geology, previous land use and ground contamination so that drainage will be effective and not increase risks of contamination. This should include seeking appropriate early advice and carrying out site investigations where required.

6 Storage, volume and peak flow rate



Suggested minimum and aspirational storage requirements for an infiltration or attenuation SuDS scheme for the development footprint are set out below, with more detail provided in subsequent sections. Storage volumes may be reduced (but not below the minimum level) if the design incorporates off-Site discharge.

Table 5. Storage requirements at the proposed development Site (Discharge runoff via infiltration)

Attenuation scenario	Attenuation required (m ³)	Explanation
1 in 100 year including 45% CC	38.80*	Attenuation required to ensure surface water runoff is attenuated in all storm events up to and including the 1 in 100 year event including a 45% allowance for climate change. Calculations are based on an assumed infiltration rate of 1×10^{-5} m/s (the worst-case infiltration rate for 'slightly silty, slightly clayey sand' soil types, taken from Table 25.1 of the CIRIA SuDS manual (C753) (2015) – to be confirmed via infiltration testing).

*Subject to confirmation through infiltration testing.

Table 6. Storage requirements at the proposed development Site (Discharge runoff to combined sewer)

Attenuation scenario		Attenuation required (m³)	Explanation	
Discharge runoff to combined sewer	1 in 30 year	23.04	Attenuation required to ensure surface water runoff is attenuated in all storm events up to and including the 1 in 30 year (1 hour, Critical Storm Duration) event*. Flooding of the Site of 8.69 m³ should be contained within permeable landscaped areas within the Site to ensure no flooding of internal areas during the 1 in 100 year storm event.	A further 20.21 m³ should be managed within overland flow routes to ensure there is no increase in flood risk in all events up to the 1 in 100 year
	1 in 100 year	31.73	Attenuation required to ensure surface water runoff is attenuated in all storm events up to and including the 1 in 100 year (1 hour, Critical Storm Duration) event*.	
	1 in 100 year including 45% CC	51.94	Attenuation required to ensure surface water runoff is attenuated in all storm events up to and including the 1 in 100 year (2 hour, Critical Storm Duration) event including a 45% allowance for climate change*.	

*See Appendix B for associated runoff and discharge calculations. Discharge rates all restricted as close as possible to greenfield rates in their respective events.

Surface water runoff

An increase in impermeable area on-Site will result in greater rainfall runoff. Reduction in runoff will help mitigate flood risk both on and off-Site. Further information on the surface water runoff calculations is provided in Section 12 'Background Information'.

Guidance

The Non-Statutory Technical Guidance for SuDS (Defra, March 2015) states:

"Where reasonably practicable, for Greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event should never exceed the Greenfield runoff volume for the same event. Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the Greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event."

Table 7. Change in impermeable area associated with the development

Total Site area	960 m ²
Impermeable area (and as a percentage of the total area of the proposed development footprint of 960 m ²)	
Pre-development	Post-development
824 m ² (86%)	879 m ² (92%)
Impermeable land use: Building roof with hardstanding Permeable land use: Landscaped areas	New impermeable land use: Building roof with hardstanding and bin store New permeable land use: Landscaped areas

Guidance

"The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30 year rainfall event' and 'flooding does not occur during a 1 in 100 year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station or electricity substation) within the development"

(Defra, March 2015, non-statutory guidance).

Peak discharge rates

The table below presents peak discharge rates for a range of storm events used to assess the impact of the proposed development and select the maximum permitted discharge rate. Further information on the calculation and control of peak discharge rates is provided in Section 12 'Background Information'.

Table 8. Peak discharge rates associated with the development

Rainfall event	Greenfield runoff rates (l/s)	Existing runoff rates ¹ (l/s)	Potential runoff rates without attenuation (l/s)	Potential minus existing (l/s)
QBAR	0.72	N/A	N/A	N/A
6 hour 1 in 1 year	0.61	1.04	1.17	0.13
6 hour 1 in 10 year	1.00	1.59	1.79	0.19
6 hour 1 in 30 year	1.21	2.07	2.32	0.26
6 hour 1 in 100 year	1.50	2.59	2.91	0.32
6 hour 1 in 100 year + 20% CC	N/A	N/A	3.49	0.90
6 hour 1 in 100 year + 45% CC	N/A	N/A	4.22	1.63

¹ Assumes 100% runoff from impermeable surfaces. Assumes Greenfield runoff from permeable surfaces calculated using the loH124 method.

Relevant national, regional and local planning policy has been consulted in Section 5 to determine restrictions on runoff from previously developed and greenfield sites. In some cases, greenfield rates may be requested, but in practice it is difficult to restrict discharge rates at any one control point to less than 2 l/s, without increasing the risk of any potential blockages occurring in the drainage network.

Total discharge volumes

The table below presents discharge volumes for a range of storm events used to assess the impact of the proposed development and calculate the required storage volumes. Further information on the calculation of total discharge volumes is provided in Section 11 'Methodology and Limitations'.

Table 9. Total discharge volumes associated with the development

Rainfall event	Greenfield runoff volume (m ³)	Existing runoff volume ² (m ³)	Potential runoff volume without attenuation (m ³)	Potential minus existing (m ³)
QBAR	12.05	N/A	N/A	N/A
6 hour 1 in 1 year	11.39	22.41	25.18	2.77
6 hour 1 in 10 year	18.10	34.42	38.62	4.20
6 hour 1 in 30 year	22.69	44.64	50.16	5.52
6 hour 1 in 100 year	28.43	55.94	62.85	6.91
6 hour 1 in 100 year + 20% CC	N/A	N/A	75.42	19.48
6 hour 1 in 100 year + 45% CC	N/A	N/A	91.13	35.19

² Assumes 100% runoff from impermeable surfaces. Assumes Greenfield runoff from permeable surfaces calculated using the loH124 method.

Critical storm duration and volume requirements

Storage volumes for a range of return periods including the 1 in 30 year, 1 in 100 year and 1 in 100 year plus climate change (45%) events have been calculated to assess the impact of the proposed development. The required storage volumes for attenuation features have been calculated for the critical storm durations, limited to a maximum discharge rate of 2 l/s.

Table 10. Critical Storm Duration and Attenuation volume requirements

Return Period	Runoff rate restriction (l/s)	Critical Storm Duration (hr)	Attenuation volume required (m ³)
1 in 30 year	2	1	23.04
1 in 100 year	2	1	31.73
1 in 100 year including a 45% allowance for climate change	2	2	51.94

7 Runoff destination



Options for the destination for the runoff generated on-Site have been assessed in line with the prioritisation set out in the Building Regulations Part H document (HM Government, published in 2010 and updated in 2015) and Defra's Non-statutory Technical Standards for SuDS (2015).

Flow attenuation using infiltration SuDS (discharge to ground) is generally the preferred option. If discharge to ground is not available, runoff discharge to surface water is the other preferred method. Only if these two options are impractical should discharge to the sewer network be considered.

Discharge to ground

The Site has high potential for infiltration, with permeable underlying geology. Based on the available borehole information (subject to confirmation by site investigation) and groundwater flood risk mapping there is a Negligible risk for groundwater flooding and low potential for high groundwater levels.

There are no known issues identified relating to Site contamination or the presence of a SPZ.

A site investigation comprising trial pits is recommended to confirm the depth to groundwater and allow infiltration tests to be undertaken to confirm the feasibility of an infiltration SuDS scheme.

Discharge to surface watercourse

Ordnance Survey (OS) mapping indicates that there are no surface water features within 100 m of the Site. Therefore, discharge to surface water feature is not feasible.

Discharge to sewer

GeoSmart has undertaken an assessment of the location of sewer features within the vicinity of the Site. There is a public combined sewer located adjacent to the northern and eastern boundaries of the Site; therefore, discharge to sewer is likely to be appropriate.

Discharge to sewer is not likely to be the optimum sustainable drainage option for the new development area. If required consultation with the local sewer undertaker should be undertaken. Discharge to sewer would only be accepted if it can be demonstrated that discharging to ground would not be reasonably practical. Discharge would have to be controlled and on-Site attenuation would be required.

8 Water quality



A key requirement of any SuDS system is that it protects the receiving water body from the risk of pollution. This can be effectively managed by an appropriate “train” or sequence of SuDS components that are connected in series. The frequent and short duration rainfall events are those that are most loaded with potential contaminants (silts, fines, heavy metals and various organic and inorganic contaminants). Therefore, the first 5-10 mm of rainfall (first flush) should be adequately treated with SuDS.

The minimum number of treatment stages will depend on the sensitivity of the receiving water body and the potential hazard associated with the proposed development SuDS Manual (CIRIA, 2015). The proposed development is a combination of Very Low (roof water) to Low hazard (runoff from car parking and road). The Site does not lie within an SPZ and therefore additional treatment stages are not required.

Table 11. Level of hazard

Hazard	Source of hazard
Very Low	Residential roof drainage
Low	Residential, amenity uses including low usage car parking spaces and roads, other roof drainage.
Medium	Commercial, industrial uses including car parking spaces and roads (excluding low usage roads, trunk roads and motorways).
High	Areas used for handling and storage of chemicals and fuels, handling of storage and waste (incl. scrap-yards).

The recommended minimum number treatment stages suggested for the different runoff waters identified for the proposed development is highlighted in the table below.

Table 12. Minimum number of treatment stages for runoff

		Sensitivity of the receiving water body		
		Low	Medium	High
Hazard	Low	1	1	1
	Med	2	2	2
	High	3	3	3

9 Proposed SuDS strategy



Sustainable drainage systems

DEFRA's non-statutory requirements for SuDS require the below ground drainage systems to have the capacity to accommodate at least the 1 in 30 year event and to manage the 1 in 100 year event without flooding of on-site buildings and substations. All runoff should be managed on-Site though for the 1 in 100 year event, accounting for the maximum impacts of climate change to ensure flood risk is not increased to third-parties.

A surface water drainage strategy (summarised in Section 2 of this report) includes the following SuDS features to intercept, attenuate and treat surface water runoff.

Primary SuDS Strategy:

Ground conditions at the Site are conducive to infiltration, surface water runoff will be managed within SuDS features and infiltrated to ground.

Table 13. Proposed SuDS type, features, discharge location and rate restriction

SuDS type	Source control (interception) and infiltration SuDS.
SuDS features	Rainwater harvesting, permeable paving and soakaway.
Discharge location	Infiltration.
Discharge rate	1×10^{-5} m/s (according to table 25.1 of the CIRIA SuDS manual, 2015).

Table 14. Proposed SuDS sizing (dimensions) and attenuation volumes

Rainwater Harvesting	Rainwater harvesting butts are proposed to allow water recycling to occur within the proposed development. In terms of attenuation storage within this SuDS scheme, the volume of run-off which could be attenuated by rainwater harvesting has not been considered within the preliminary SuDS strategy.
Permeable Paving	A 319 m ² area of unlined permeable paving (underlain with a Type 3 aggregate material) within the proposed driveway and parking areas to a depth of 0.66 m, with a 30% porosity.
Soakaway	A soakaway located in the parking area to the rear of the property with dimensions 6 m x 6 m x 1.20 m, filled with geo-cellular crates with a void ratio of 95%, will attenuate a minimum of 41.04 m³. The soakaway should be located 5 m from built foundations and 2-3 m from the adjacent road network.

Total Attenuation Provided	41.04 m ³
Total Attenuation Required	38.80 m ³
Freeboard Storage Provided	2.24 m ³

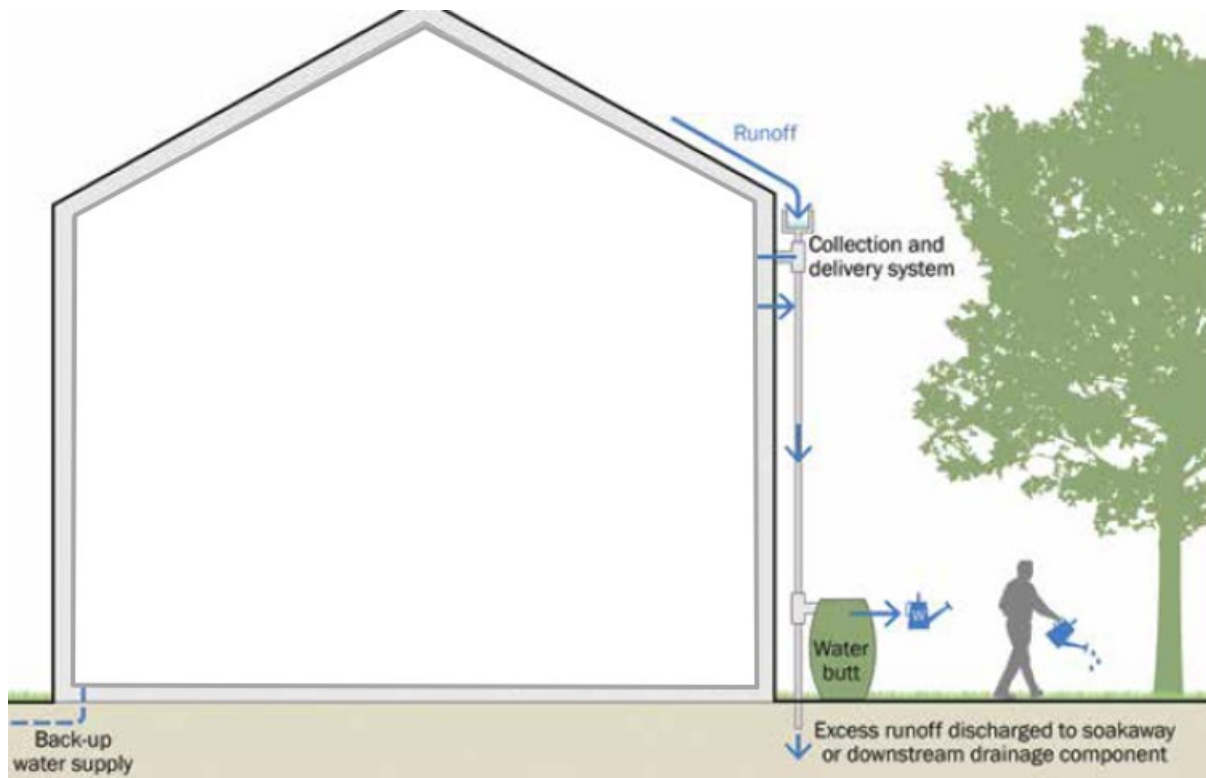
Rainwater harvesting

A rainwater harvesting butt is proposed. The run-off from the proposed development roof should be led into rainwater harvesting butts via rainwater downpipes and guttering to catch run-off from the roof. Overflow from the butts should be discharged into the storage system provided by the soakaway.

Due to the relatively insignificant amounts of attenuation provided by rainwater harvesting tanks in this instance and the requirement to retain water for non-potable uses such as garden maintenance, the volume of run-off which could be attenuated by rainwater harvesting has not been considered within the report.

As there is an issue with the storage capability of rainwater harvesting tanks, this method should have a fixed attenuation volume and a controlled outlet to discharge into the proposed SuDS feature. An overflow system will be required for implementation on the Site due to exceedance events (where the pumps fail or there is a blockage within the system / or the number of residents and subsequent water usage is reduced).

Roof run-off is generally less polluted than run-off from road surfaces but can still generate pollutants such as sediments. Pollutants would be captured by the collection and filtration system and, by reducing the volume of run-off generated from the Site. Primary screening devices are used to prevent leaves and other debris from entering the butt and first flush devices can be designed to divert the first part of the rainfall away from the main storage tank and can pick up most of the dirt, debris and contaminants that collect on a residential roof.



Modified from Figure 11.3 of the CIRIA SuDS Manual (C753) (2015)

Permeable paving

Unlined permeable paving is proposed for the car park and hardstanding access areas to intercept runoff. Suitable aggregate materials (angular gravels with suitable grading as per CIRIA, 2015) will improve water quality due to their filtration capacity and usually work to a 30% porosity. A geotextile layer will be required for paving underlain by aggregate material to intercept silt/particles. Permeable pavements are multi-layered surfacing systems. The surface layer is constructed out of permeable material allowing infiltration of water through gaps along its surface. A geomembrane isolates stored water from the surrounding soil, especially in contaminated areas and a geotextile layer prevents clogging and damage to the geo-cellular modules.

The geotextile layer works to intercept silt/particles flowing through the system via direct rainfall, or through vehicle use deposited onto the car park area and into the permeable paving. The majority of silt would be trapped within the top 30mm of the joining material between the paving blocks. Rainfall flowing into the permeable paving directly from the development roof/rainwater butts would not contain enough volumes of silt and or particles to cause blockage so will be fed directly into underlying porous substrate via rainwater pipes. Downpipes from the development roofs/rainwater butts should extend through the paving for c.5 meters to divert roof run-off away from building foundations. Paving could also implement an impermeable liner close to the building or creating a separate compartment within the permeable sub-base close to the building to further divert attenuated water away from building foundations.

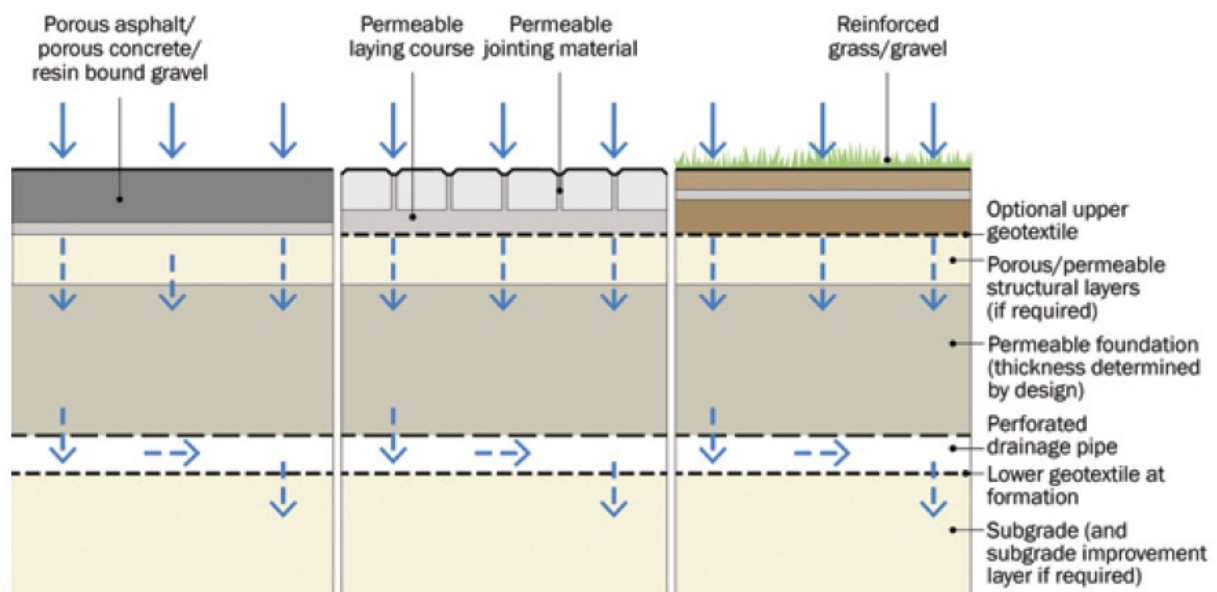


Figure 20.13 of the CIRIA SuDS Manual (C753) (2015)

Plastic geo-cellular systems could also be used, which can increase the void space and therefore storage but do not allow filtration unless they are combined with aggregate material and/or permeable geotextiles which could increase their storage potential by up to 20%. Geo-cellular modules also have the added advantage of reducing the amount of aggregate sub base required, thus keeping costs lower.

Soakaways

Soakaways should be used to store run-off and infiltrate collected water gradually into the ground. Roof water should be collected and conveyed by underground pipes to the proposed soakaways. The base of the infiltration features should lie at an elevation at least 1 m above the highest winter groundwater levels, to ensure there is sufficient space for surface water to discharge. Soakaway excavation should be outside of the root zone of any protected trees and dimensions will depend on the depth to the sand layer where the soakaway is eventually situated.

Draining via soakaways means that property owners are less likely to pay for the utility company to drain surface water. In terms of future ownership and maintenance, where a soakaway drains a single property, the ownership and maintenance would be the property owner's responsibility. When a soakaway drains several properties, an agreement would have to be made between the property owners with regards to the maintenance. However, in the new sewers for adoption guidance, utility providers may adopt private soakaways and provide the necessary maintenance:

Soakaways: Adoption would normally include the whole structure up to the external face, including any external rubble fill or membrane

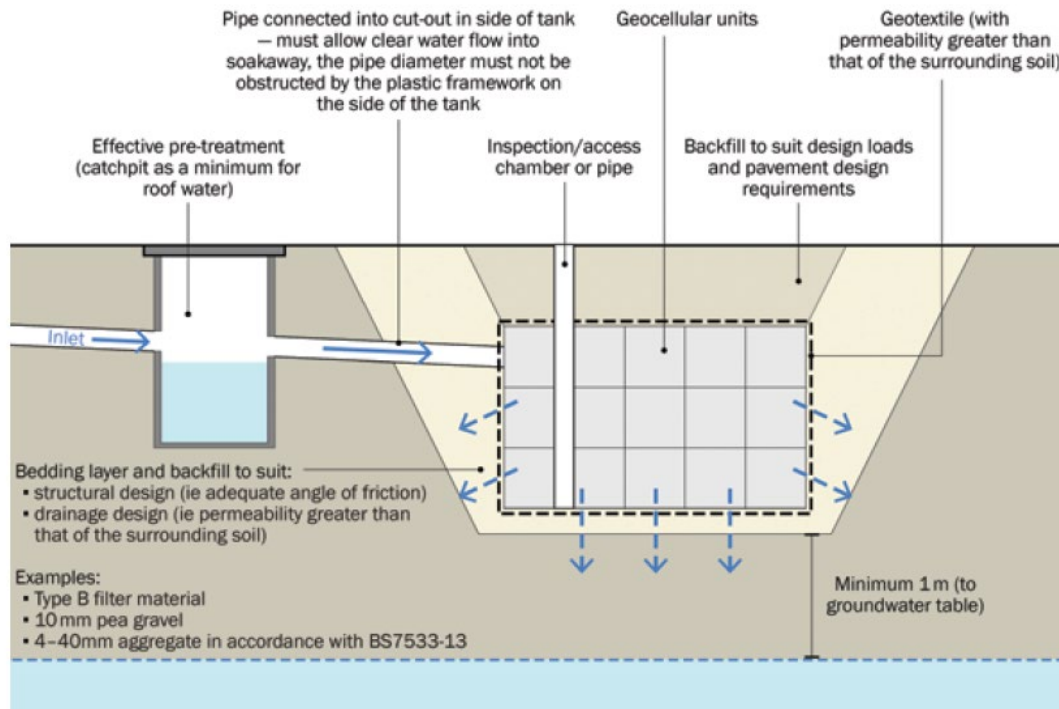


Figure 13.1 of the CIRIA SuDS Manual (C753) (2015)

Exceedance Flows

Exceedance flow routes are included within the proposed SuDS drainage layout. Where possible, exceedance flows should be directed away from buildings and into non-essential areas of the Site such as the car park. The SuDS system recommended for the Site should provide enough storage that this method would only be utilised during a worst case scenario.

Secondary SuDS strategy:

Where infiltration to ground is not achievable at the Site, an attenuation volume of 51.94 m³ should be stored within lined SuDS features to accommodate the calculated 2 hour Critical Storm Duration for surface water discharge runoff, restricted to 2 l/s.

If the infiltration rates are not as high as predicted, discharging runoff to the public combined sewer after attenuation would provide a betterment compared to the existing development.

Permeable paving can still be incorporated if discharge to ground is not achievable; however, paving will need to be lined to ensure groundwater does not interact with the system.

Table 15. Proposed SuDS type, features, discharge location and rate restriction

SuDS type	Source control (interception) and attenuation SuDS.
SuDS features	Rainwater harvesting and permeable paving.
Discharge location	Public combined sewer network.
Discharge rate	2 l/s (as close to the 1 in 1 year Greenfield runoff rate as possible without increasing the potential for blockages).

Table 16. Proposed SuDS sizing (dimensions) and attenuation volumes

Rainwater Harvesting	Rainwater harvesting butts are proposed to allow water recycling to occur within the proposed development. In terms of attenuation storage within this SuDS scheme, the volume of run-off which could be attenuated by rainwater harvesting has not been considered within the preliminary SuDS strategy.
Permeable paving	A 319 m ² area of lined permeable paving (underlain with a Type 3 aggregate material) within the proposed driveway and parking areas to a depth of 0.66 m, with a 30% porosity would result in c. 63.16 m ³ attenuation.
Total Attenuation Provided	63.16 m ³
Total Attenuation Required	51.94 m ³
Freeboard Storage Provided	11.22 m ³

Flow control devices and systems

Hydrobrake Flow control systems can be used to reduce the runoff rate from the Site. These are usually a device used for controlling water flow into a connecting feature, such as a sewer, to a specific attenuation performance. The design consists of an intake, a volute and an outlet and the configuration is critical to ensure discharge control. For drainage areas which are less than 3 ha, outlet throttle diameters would have to be small (<150mm diameter) to achieve outflow rates which could result in blockage. For most SuDS features, a flow control device will comprise a fixed orifice or a throttle such as a short pipe.

A Vortex Control is usually a self-activating vortex flow device which directs water into a volute to form a vortex. For the Site, rainwater down pipes from the development roof should drain directly into the attenuation feature to reduce infill from potential flood water.

Drainage protection devices

A non-return flap valve is recommended for outflow pipes to reduce the risk of backflow from the sewer during a large scale rainfall event.

10 SuDS maintenance



Regular maintenance is essential to ensure effective operation of the SuDS features over the intended lifespan of the proposed development. The SuDS Manual (C753) (CIRIA, 2015) provides a maintenance schedule for SuDS with details of the necessary required actions as shown in the Table below.

Table 17. SuDS operation and recommended maintenance requirements

Asset type	Maintenance schedule (and frequency)
Soakaways,	Regular maintenance: - Remove sediment and debris from pretreatment and inspection chamber. Clean gutters, filters, downpipes. Trim roots prevent blockages (annually). - Reconstruct/ clean if performance deteriorates, replace clogged geotextile (as required) Monitoring: - Inspect inlets/outlets, silt traps – note rate of accumulation (monthly). - Check water levels and emptying time (annually).
Permeable pavements	Regular maintenance: - Brushing and vacuuming (three times per year). - Trimming any roots and surrounding grass and weeds that may be causing blockages (annually or as required). Monitoring: - Initial inspection (monthly). - Inspect for poor performance and inspection chambers (annually).
Hydro-Brake Flow Control	Low amounts of maintenance required as there are no moving parts within the Hydro-Brake® Flow Control. Initial monthly inspection at the manhole once the construction phase is over. If blockages occur they normally do so at the intake. Hydro-Brake® Flow Controls are fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur. Inspection should be undertaken annually or when a storm event occurs.
Underground drainage pipe network	Regular maintenance: - Remove sediment and debris from pre-treatment devices and floor of inspection tube or chamber (annually). - Cleaning of gutters and any filters on downpipes (annually).

Asset type	Maintenance schedule (and frequency)
	- Trimming any roots that may be causing blockages (annually or as required). Monitoring: - Inspect silt traps and note rate of sediment accumulation (monthly in the first year and then annually).
Rainwater Harvesting	Regular maintenance: - Inspection of tank for debris and sediment build up (annually and following poor performance). - Inspection of inlets, outlets, overflow areas, pumps and filters (annually and following poor performance). - Cleaning of tank, inlets, outlets, gutters, roof drain filters and withdrawal devices (annually or as required). Remedial actions: - Repair or overflow erosion damage or damage to tank and associated components (as required)

Client checklist

A drainage strategy has been recommended as suitable on the basis of the information provided. Prior to installation of the Site drainage system it is recommended that the client carries out the following checks to confirm the development proposals. GeoSmart would be able to support with any updates required to the drainage scheme, please contact us and we would be happy to provide you with a proposal to undertake the work.

Table 18. Potential SuDS limitations

Conditions in Non-Statutory Technical Standards (Defra, 2015), limitations to infiltration SuDS	Do these conditions arise at the Site?
Is the surface runoff greater than the rate at which water can infiltrate into the ground?	
Is there an unacceptable risk of ground instability?	
Is there an unacceptable risk of mobilising contaminants?	
Is there an unacceptable risk of pollution to groundwater?	
Is there an unacceptable risk of groundwater flooding?	
Is the infiltration system going to create a high risk of groundwater leakage to the combined sewer?	

Table 19. SuDS design considerations

Confirm that potential flooding on-Site in excess of the design storm event and exceedance flow routes have been considered.	
Review options for the control of discharge rates (e.g. hydrobrake).	
Confirm the owners/adopters of the drainage system. Consider management options for multiple owners.	
Is there an unacceptable risk of pollution to groundwater?	
Review access and way leave requirements.	
Review maintenance requirements.	

Health and safety considerations for SuDS

GeoSmart reports may include outline strategies or designs to support with development plans. Any drawings or advice provided do not comprise any form of detailed design. Implementation of any conceptual scheme options may constitute 'Construction Work' as defined by CDM Regulations (2015).

The CDM Regulations place specific Health and Safety duties on those commissioning, planning and undertaking construction works. If you are uncertain what this means you should seek the advice of your architect, builder or other competent professional.

GeoSmart does not provide health and safety advisory services but we are required to advise you of your general responsibilities under CDM (visit <http://geosmartinfo.co.uk/knowledge-hub/cdm-2015/> for more information).

Please remember that detailed design work should be undertaken by a competent professional who might be your engineer, architect, builder or another competent party.

11 Methodology and limitations of study



This report assesses the feasibility of infiltration SuDS and alternative drainage strategies in support of the Site development process. From April 6th 2015 SuDS are regulated by Local Planning Authorities and will be required under law for major developments in all cases unless demonstrated to be inappropriate. What is considered appropriate in terms of costs and benefits by the Planning Authority will vary depending on local planning policy, and Site setting. The Lead Local Flood Authority will require information as a statutory consultee on major planning applications with surface water drainage implications. The National Planning Policy Framework requires that new developments in areas at risk of flooding should give priority to the use of SuDS and demonstrate that the proposed development does not increase flood risk downstream to third parties.

How was the suitability of SuDS estimated for the Site?

There are a range of SuDS options available to provide effective surface water management that intercept and store excess runoff. When considering these options, the destination of the runoff should be assessed using the order of preference outlined in the Building Regulations Part H document (HM Government, 2010) and Defra's National Standards for SuDS (2015):

1. Discharge to the ground;
2. Discharge to a surface water body;
3. Discharge to a surface water sewer;
4. Discharge to a local highway drain; and
5. Discharge to a combined sewer.

Data sets relating to each of the potential discharge options have been analysed to assess the feasibility of each option according to the hierarchy set out above. Hydrogeological characteristics for the Site are assessed in conjunction with the occurrence of SPZ's to assess infiltration suitability. The Site has been screened to determine whether flood risk from groundwater, surface water, fluvial or coastal sources may constrain SuDS. The distance to surface water bodies and sewers has been reviewed gauge whether these provide alternative options.

GeoSmart SuDS Infiltration Suitability Map (SD50)

The GeoSmart SuDS Infiltration Suitability Map (SD50) screens the suitability for infiltration drainage in different parts of the Site and indicates where further assessment is recommended. In producing the SuDS Infiltration Suitability Map (SD50), GeoSmart used data from the British Geological Survey on groundwater levels, geology and permeability to screen

for areas where infiltration SuDS may be suitable. The map classifies areas into 3 categories of High, Medium and Low suitability for infiltration SuDS. This can then be used in conjunction with additional data on Site constraints to give recommendations for SuDS design and further investigation.

The primary constraint on infiltration potential is the minimum permeability of the underlying material and in some cases the range in permeability may be considerable, ranging down to low. The map classifies these areas as moderate infiltration suitability requiring further investigation. In cases where the thickness of the receiving permeable horizon is less than 1.5 meters then additional Site investigation is recommended. If the Site is at risk of groundwater flooding for up to the 1% annual occurrence the map classifies these areas as moderate infiltration suitability requiring further investigation.

The GeoSmart SuDS Infiltration Suitability Map (SD50) is a national screening tool for infiltration SuDS techniques but a Site specific assessment should be used before final detailed design is undertaken. Further information on the GeoSmart SuDS Infiltration Suitability Map (SD50) is available at geosmartinfo.co.uk

How is the suitability to discharge to sewers and watercourses calculated?

The suitability to discharge to discharge to sewers and watercourses has been calculated using the distance from the Site to both. For example, where the Site is within 50 m of a surface water body. Discharge to surface water is potentially appropriate subject to land access arrangements and a feasibility assessment. Where the Site is within 50 m of a sewer, discharge to sewer is potentially appropriate subject to land access arrangements and a feasibility assessment. The utility company should be contacted to agree connection feasibility and sewer capacity.

Further information relating to sewers available in the area can be found in Appendix C.

What is a Source Protection Zone?

The Environment Agency have defined Source Protection Zones (SPZs) for 2000 groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. The maps show three main zones (inner, outer and total catchment) and a fourth zone of special interest, which is occasionally applied. The zones are used to set up pollution prevention measures in areas which are at a higher risk. The shape and size of a zone depends on the condition of the ground, how the groundwater is removed, and other environmental factors. Inner zone (Zone 1) is defined as the 50 day travel time from any point below the water table to the source (minimum radius of 50 metres). Outer zone (Zone 2) is defined by a 400 day travel time. Total catchment (Zone 3) is defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source.

How was surface water runoff estimated from the Site?

In accordance with The SuDS Manual (C753) (CIRIA, 2015), the Greenfield runoff from the Site has been calculated using the IoH124 method and is assumed representative of the runoff generated on the undeveloped surfaces that are affected by the proposed development. The method used for calculating the runoff complies with the NPPF (MHCLG, 2023). For the impermeable surfaces, it has been assumed that 100% runoff will occur (calculations provided in Appendix B). Rainfall data is derived from the Flood Estimation Handbook (FEH), developed by NERC (2009). Only areas affected by the proposed development are considered in the flow and volume calculations. Permeable areas that remain unchanged are not included in the calculations as it is assumed these will not be actively drained and attenuated.

What is the peak discharge rate?

An estimation of peak runoff flow rate and volume is required to calculate infiltration, storage and discharge requirements. The peak discharge rate is the maximum flow rate at which surface water runoff leaves the Site during a particular storm event, without considering the impact of any mitigation such as storage, infiltration or flow control. Proposed discharge rates (with mitigation) should be no greater than existing rates for all corresponding storm events. If all drainage is to infiltration there will be no discharge off-Site. Discharging all flow from Site at the existing 1 in 100 event would increase flood risk during smaller events. Flow restriction is generally required to limit the final discharge from Site during all events as a basic minimum to the green field QBAR rate. A more complex flow restriction which varies the final discharge rate from the Site depending on the storm event will reduce the volume of storage required on-Site. Drainage to infiltration SuDS is subtracted from the total discharge off-Site to achieve a beneficial net affect.

What is the total discharge volume?

The total discharge volume is calculated on the basis of the surface water runoff that has the potential to leave the Site as a result of the assumed 6 hour duration design storm event. The runoff is related to the underlying soil conditions, impermeable cover, rainfall intensity and duration of the storm event. The total volume generated by the current Site is compared to the potential total volume from the developed Site (not taking into consideration any mitigation). The difference provides the minimum total volume that will need to be stored and infiltrated on-Site or released at a controlled rate. Guidance indicates that the total discharge volume should never exceed the runoff volume from the development Site prior to redevelopment for that event and should be as close as is reasonably practicable to the Greenfield runoff volume.

12 Background SuDS information



SuDS control surface water runoff close to where it falls. SuDS are designed to replicate, as closely as possible, the natural drainage from the Site before development to ensure that the flood risk downstream does not increase as a result of the Site being developed, and that the Site will have satisfactory drainage under current and likely future climatic conditions. SuDS provide opportunities to reduce the causes and impacts of flooding; remove pollutants from urban runoff at source; and combine water management with green space with benefits for amenity, recreation and wildlife. Government planning policy and planning decisions now include a presumption in favour of SuDS being used for all development Sites, unless they can be shown to be inappropriate.

For general information on SuDS see our website: <http://geosmartinfo.co.uk/>

Infiltration SuDS

Government policy for England is to introduce sustainable drainage systems (SuDS) via conditions in planning approvals. Guidance indicates that capturing rainfall runoff on-Site and infiltrating it into the ground (infiltration SuDS) is the preferred method for managing surface water without increasing flood risk downstream.

The greatest benefit to general flood risk is if all runoff is infiltrated on-Site, however, this may not be feasible due to physical and economic constraints in which case infiltration may be considered as a part of an integrated drainage solution. The final design capacity for an infiltration SuDS system depends on the Site constraints and the requirements of the individual Planning Authority and the Lead Local Flood Authority.

The capacity of the ground to receive infiltration depends on the nature, thickness and permeability of the underlying material and the depth to the high groundwater table. The final proportion of the Site drained by infiltration will depend on topography, outfall levels and a suitable drainage gradient. It is important to note that, even if the whole Site cannot be drained by infiltration, the use of partial infiltration is encouraged, with the remainder of runoff discharged via other SuDS systems.

Types of infiltration SuDS

Infiltration components include infiltration trenches, soakaways, swales and infiltration basins without outlets, rain gardens and permeable pavements. These are used to capture surface water runoff and allow it to infiltrate (soak) and filter through to the subsoil layer, before returning it to the water table below.

An infiltration trench is usually filled with permeable granular material and is designed to promote infiltration of surface water to the ground. An infiltration basin is a dry basin or depression designed to promote infiltration of surface water runoff into the ground. Soakaways are the most common type of infiltration device in the UK where drainage is often connected to over-sized square or rectangular, rubble-filled voids sited beneath lawns.

According to the guidance in Building Research Establishment (BRE) Digest 365 (2016) a soakaway must be able to discharge 50% of the runoff generated during a 1 in 10 year storm event within 24 hours in readiness for subsequent storm flow. This is the basic threshold criteria for a soakaway design and the internal surface area of the proposed soakaway design options should be calculated on this basis by taking into account the soil infiltration rate for the Site.

Developers need to ensure their design takes account of the construction, operation and maintenance requirements of both surface and subsurface components, allowing for any machinery access required.

SuDS maintenance and adoption

Regular maintenance is essential to ensure effective operation of the soakaway(s) over the intended lifespan of the proposed development. A maintenance schedule for SuDs is required. Sewerage undertakers or Local Authorities may adopt SuDS and will require maintenance issues to be dealt with in accordance with their Management Plan. If the SuDS will not be adopted other provision is required with associated financial implications. Maintenance is a long-term obligation requiring the upkeep of all elements of the SuDS, including mechanical components (e.g. pumps), as well as inspections, regular maintenance and repair.

Additional background SuDS information can be found on our website: <http://geosmartinfo.co.uk/>

13 Further information



The following table includes a list of additional products by GeoSmart:

Additional GeoSmart Products			
	Additional assessment: FloodSmart Report		The FloodSmart Report range provides clear and pragmatic advice regarding the nature and potential significance of flood hazards which may be present at a Site. Our consultants assess available data to determine the level of risk based on professional judgement and years of experience. Please contact info@geosmartinfo.co.uk for further information.
	Additional assessment: EnviroSmart Report		Provides a robust desk-based assessment of potential contaminated land issues, taking into account the regulatory perspective. Our EnviroSmart reports are designed to be the most cost effective solution for planning conditions. Each report is individually prepared by a highly experienced consultant conversant with Local Authority requirements. Ideal for pre-planning or for addressing planning conditions for small developments. Can also be used for land transactions. Please contact info@geosmartinfo.co.uk for further information.

14 References and glossary



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Glossary

General terms

Attenuation	Reduction of peak flow and increased duration of a flow event.
Combined sewer	A sewer designed to carry foul sewage and surface water in the same pipe.
Detention basin	A vegetated depression, normally is dry except after storm events, constructed to store water temporarily to attenuate flows. May allow infiltration of water to the ground.
Evapotranspiration	The process by which the Earth's surface or soil loses moisture by evaporation of water and by uptake and then transpiration from plants.
FEH	Flood Estimation Handbook, produced by Centre for Ecology and Hydrology, Wallingford (formerly the Institute of Hydrology).
Filter drain or trench	A linear drain consisting of a trench filled with a permeable material, often with a perforated pipe in the base of the trench to assist drainage, to store and conduct water, but may also be designed to permit infiltration.
First flush	The initial runoff from a site or catchment following the start of a rainfall event. As runoff travels over a catchment it will collect or dissolve pollutants, and the "first flush" portion of the flow may be the most contaminated as a result. This is especially the case for intense storms and in small or more uniform catchments. In larger or more complex catchments pollution.
Flood plain	Land adjacent to a watercourse that would be subject to repeated flooding under natural conditions (see Environment Agency's Policy and practice for the protection of flood plains for a fuller definition).
Greenfield runoff	This is the surface water runoff regime from a site before development, or the existing site conditions for brownfield redevelopment sites.
Impermeable surface	An artificial non-porous surface that generates a surface water runoff after rainfall.
Permeability	A measure of the ease with which a fluid can flow through a porous medium. It depends on the physical properties of the medium, for example grain size, porosity and pore shape.

Runoff	Water flow over the ground surface to the drainage system. This occurs if the ground is impermeable, is saturated or if rainfall is particularly intense.
Sewerage undertaker	This is a collective term relating to the statutory undertaking of water companies that are responsible for sewerage and sewage disposal including surface water from roofs and yards of premises.
Soakaway	A subsurface structure into which surface water is conveyed to allow infiltration into the ground.
Treatment	Improving the quality of water by physical, chemical and/or biological means.

The terms included in this glossary have been taken from CIRIA (2015) guidance.

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Flood Risk (Groundwater) and SuDS infiltration suitability (SD50)	GeoSmart, BGS & OS GW5 (v2.4) Map (GeoSmart, 2024) Contains British Geological Survey materials © NERC 2024 Ordnance Survey data © Crown copyright and database right 2024
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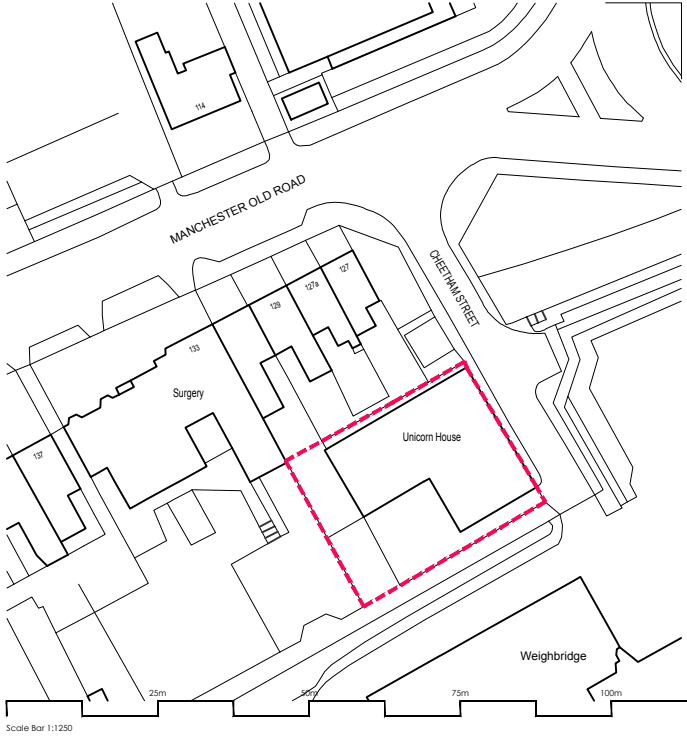
15 Appendices



Appendix A



Site plans



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revisions

client	date	
SHR property management ltd	09/08/2024	
project	scale	drawn by
Unicorn House, Cheetham Rd, Middleton, Manchester M24 4DG	1:500 @ A3 1:1250 @ A3	ML
title	drawing no	checked by
Location Plan	398(PL)001	SP
status	job no	revision
Planning	398	*



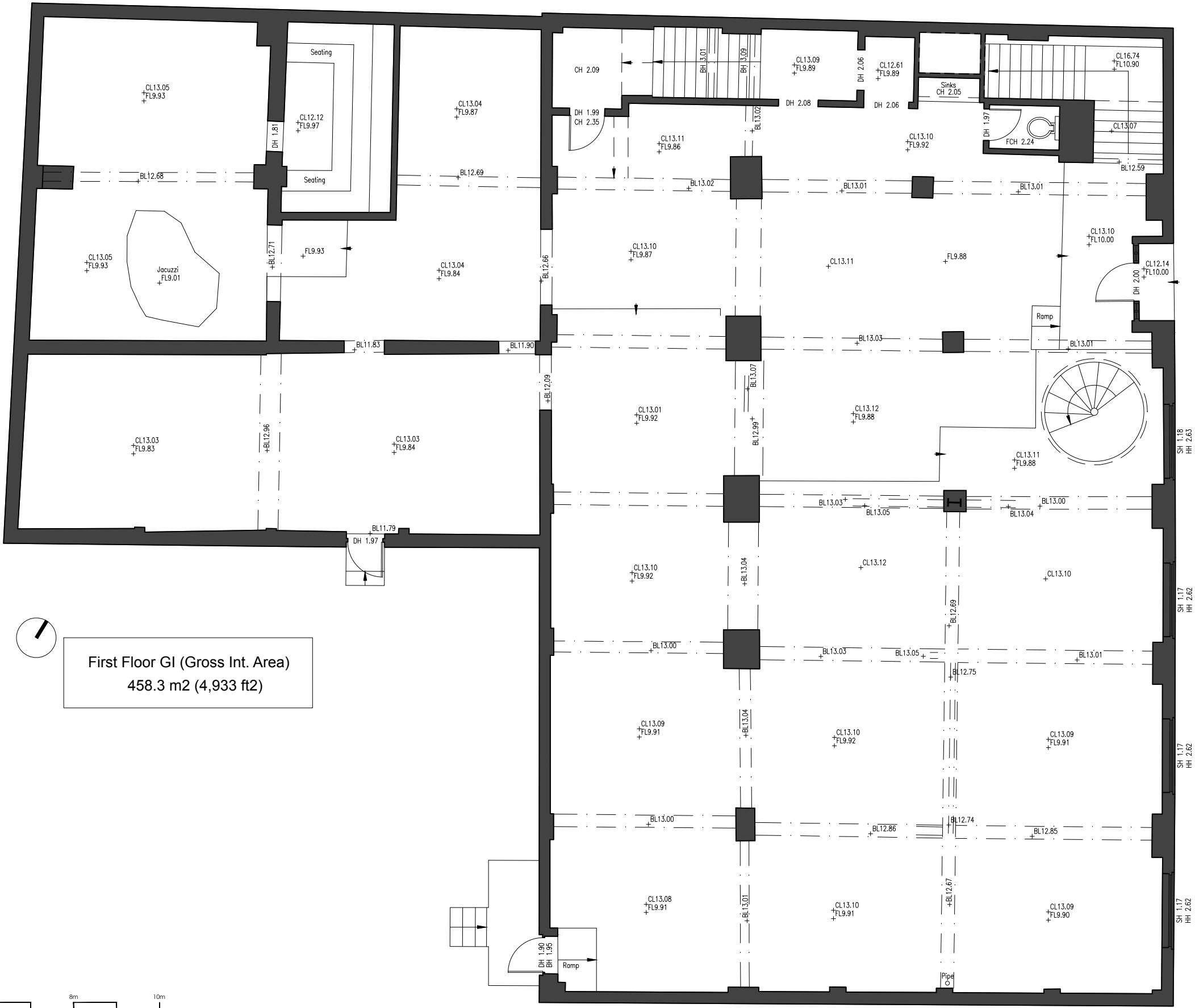
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revisions

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project	scale	drawn by
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title	drawing no	checked by
Proposed Site Plan	398(PL)002	SP
status	job no	revision
Planning	398	*

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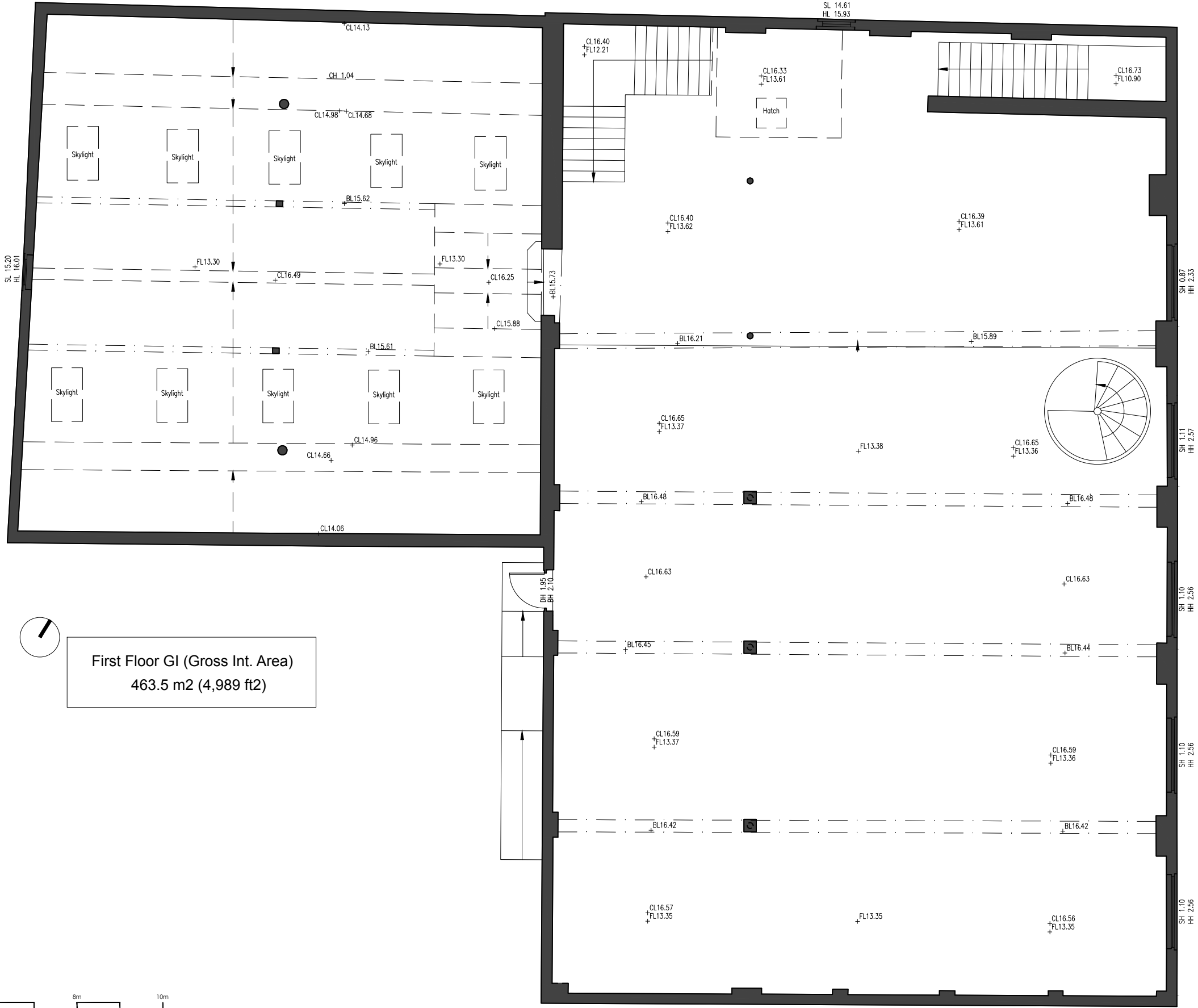
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revisions

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title	Ground Floor Layout- EXISITING	drawing no	398(PI)010
status	Planning	checked by	SP
		revision	*

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First Floor GI (Gross Int. Area)
463.5 m2 (4,989 ft2)

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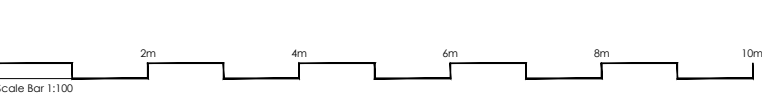
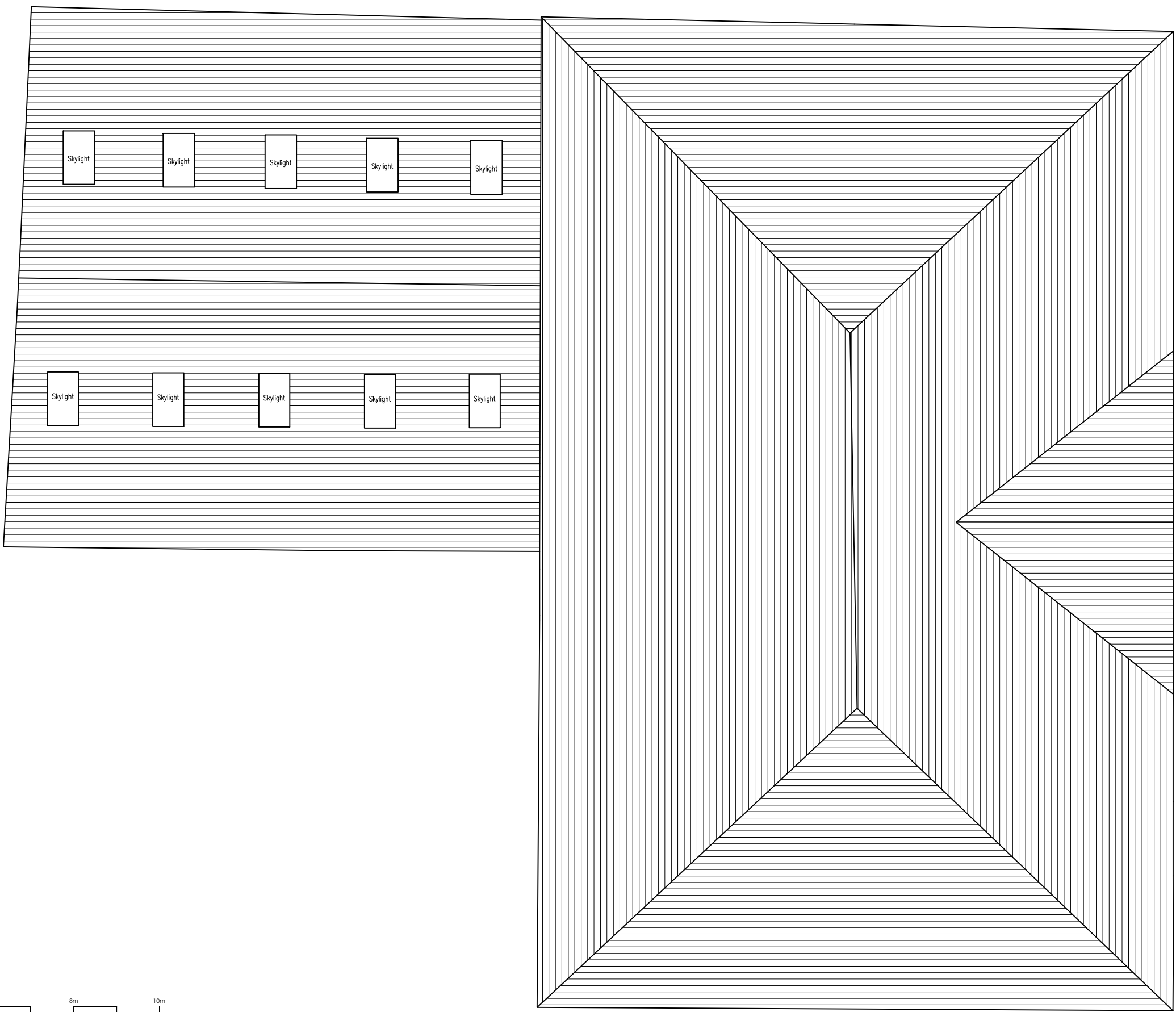
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revisions

client	SHR property management ltd	date	09/08/2024
project	Unicorn House, Cheetham Rd, Manchester M24 4DG	scale	1:100 @ A3
title	First Floor Layout- EXISTING	drawing no	398(PI)011
status	Planning	checked by	SP
		revision	*

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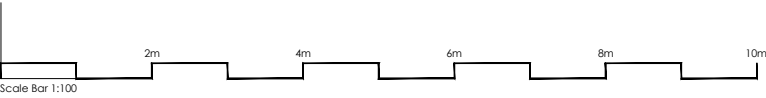
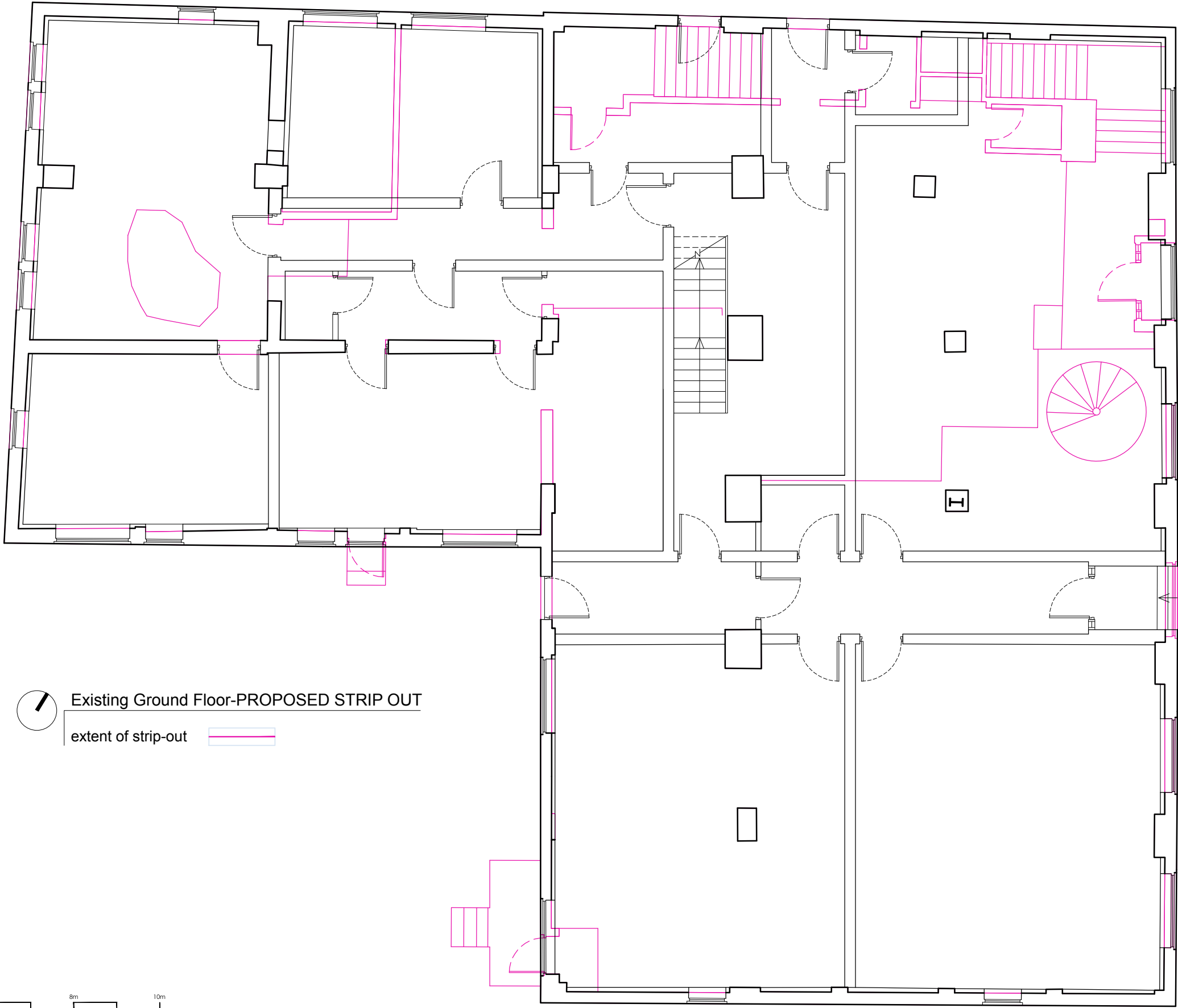
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revisions

client	date	
SHR property management ltd	09/08/2024	
project	scale	drawn by
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title	drawing no	checked by
Roof Layout- EXISTING	398(PI)012	SP
status	job no	revision
Planning	398	*

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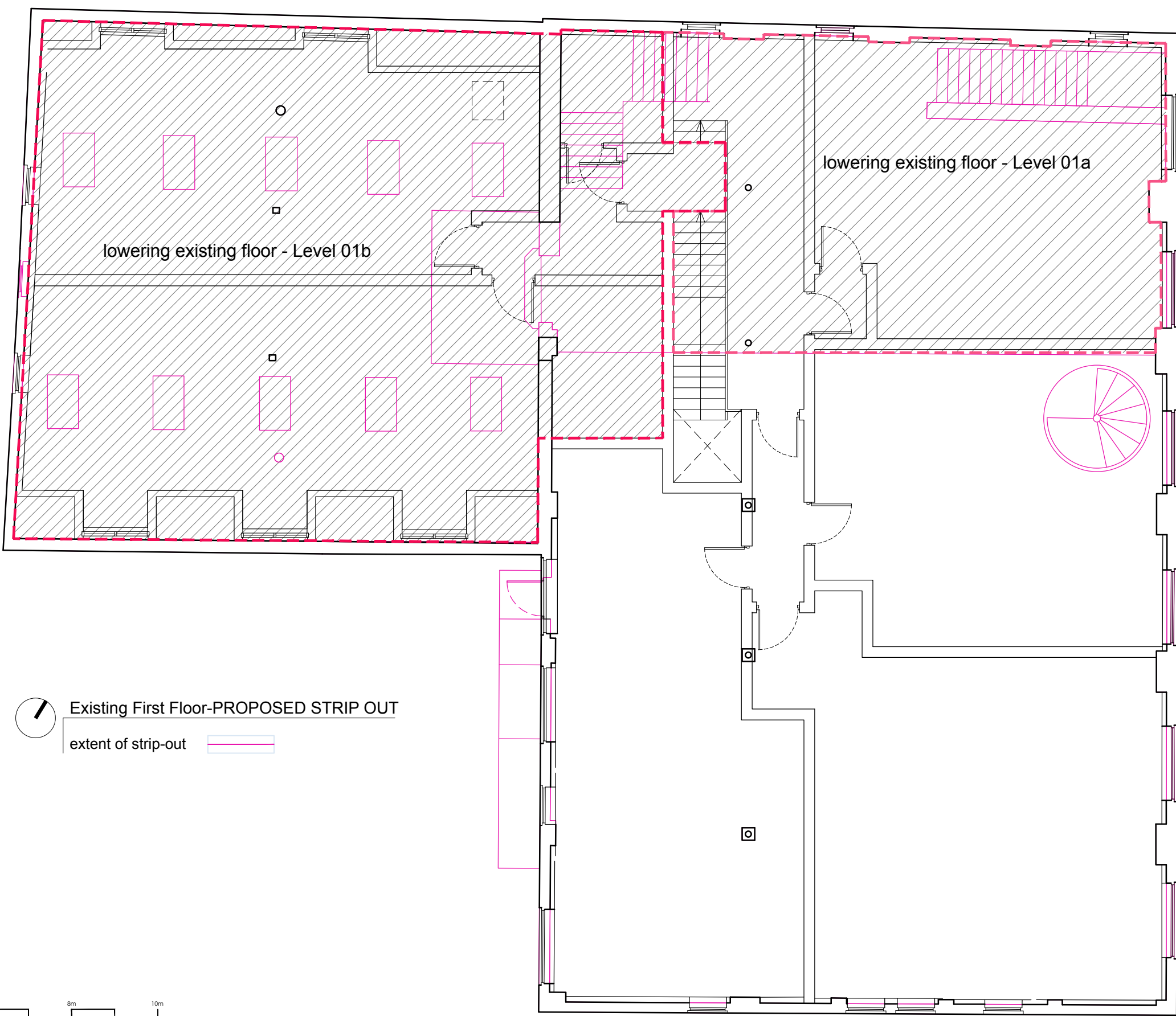
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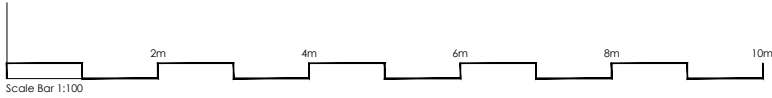
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title	Ground Floor- STRIP OUT		drawing no	398(PI)020	
status	Planning		checked by	SP	
			job no	398	
			revision	•	

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Existing First Floor-PROPOSED STRIP OUT
extent of strip-out



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revisions
rev A 03/07/24 existing first floor alterations further to client instructions

client	SHR property management ltd	date	09/08/2024
project	Unicorn House, Cheetham Rd, Manchester M24 4DG	scale	1:100 @ A3
title	First Floor- STRIP OUT	drawing no	398(PI)021
status	Planning	checked by	SP
		job no	398
		revision	*

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Proposed Ground Floor Layout
5no. apartments @ Level 00

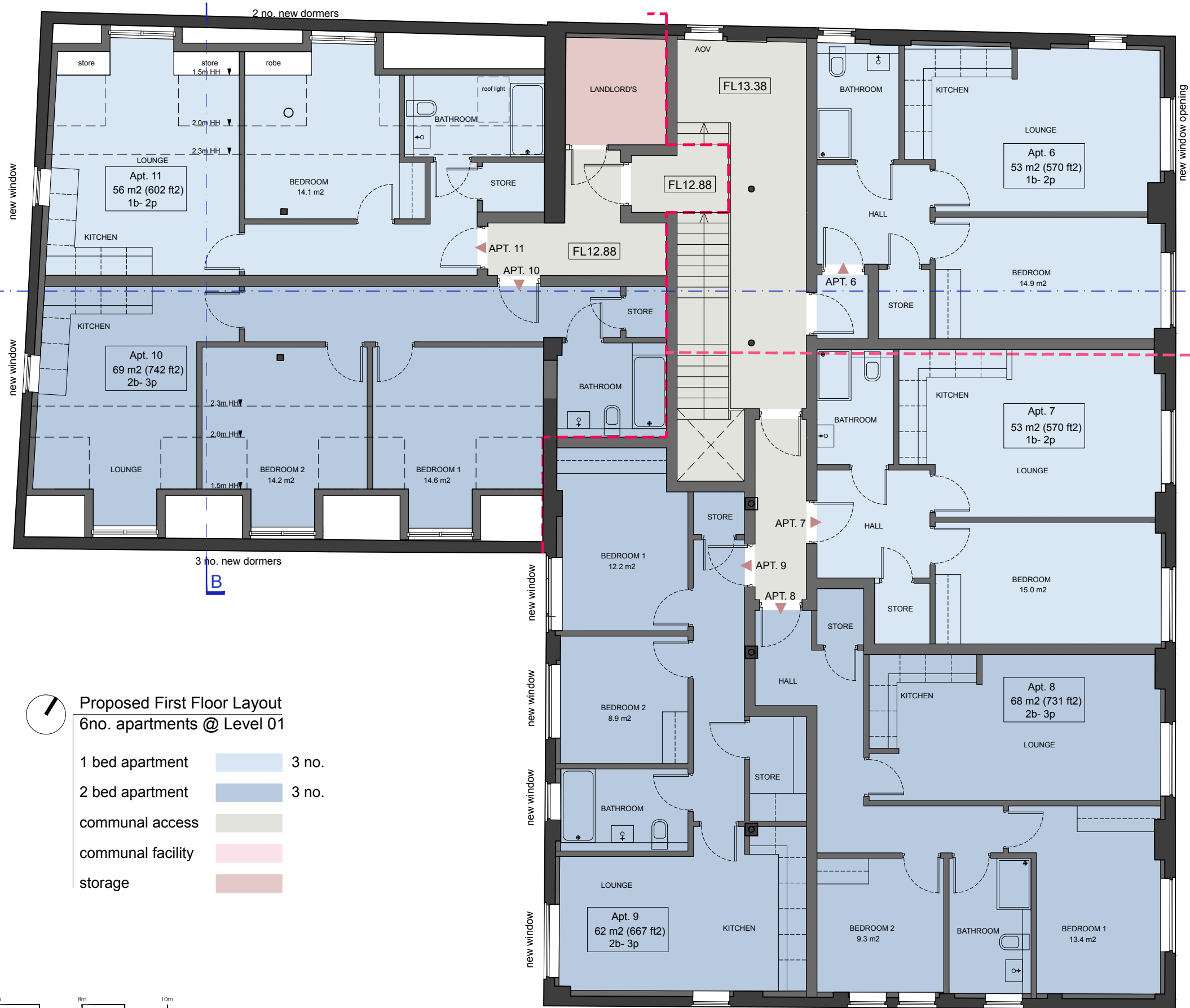
1 bed apartment	3 no.
2 bed apartment	2 no.
communal access	
communal facility	
office- communal	

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client	date	
SHR property management ltd	09/08/2024	
project	scale	drawn by
Unicorn House, Cheetham Rd, Middleton, Manchester M24 4DG	1:100 @ A3	ML
title	drawing no	checked by
Ground Floor- PROPOSED General Arrangement	398(PI)030	SP
status	job no	revision
Planning	398	*

A

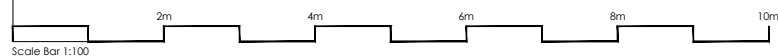


A



Proposed First Floor Layout 6no. apartments @ Level 01

- 1 bed apartment 3 no.
- 2 bed apartment 3 no.
- communal access
- communal facility
- storage

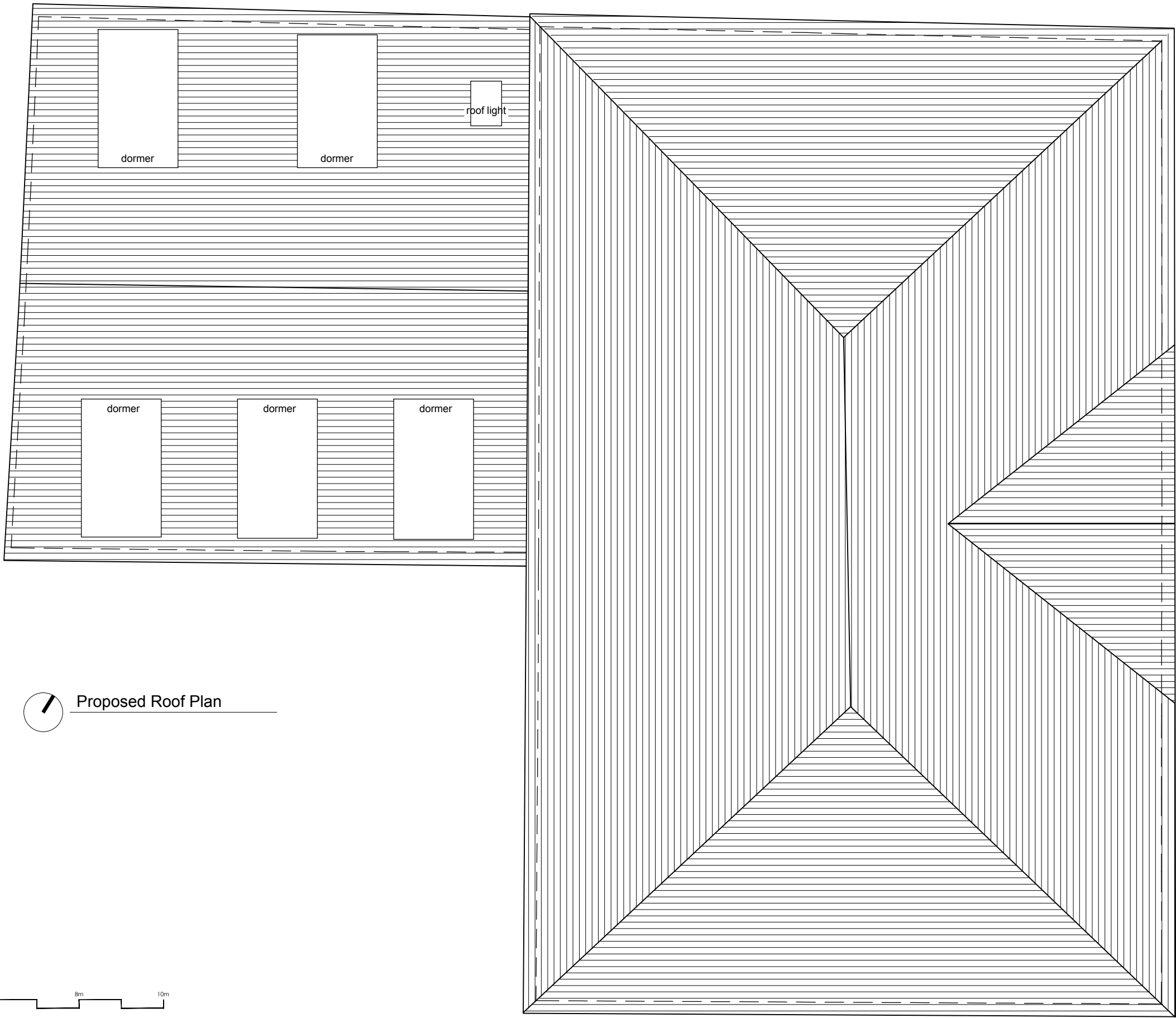


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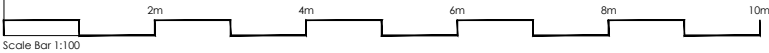
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revisions		
rev A	03/07/24	existing first floor alterations further to client instructions

client		date	
SHR property management ltd		09/08/2024	
project		scale	drawn by
Unicorn House, Cheetham Rd, Manchester M24 4DG		1:100 @ A3	ML
title		drawing no	checked by
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Planning		398	*



Proposed Roof Plan



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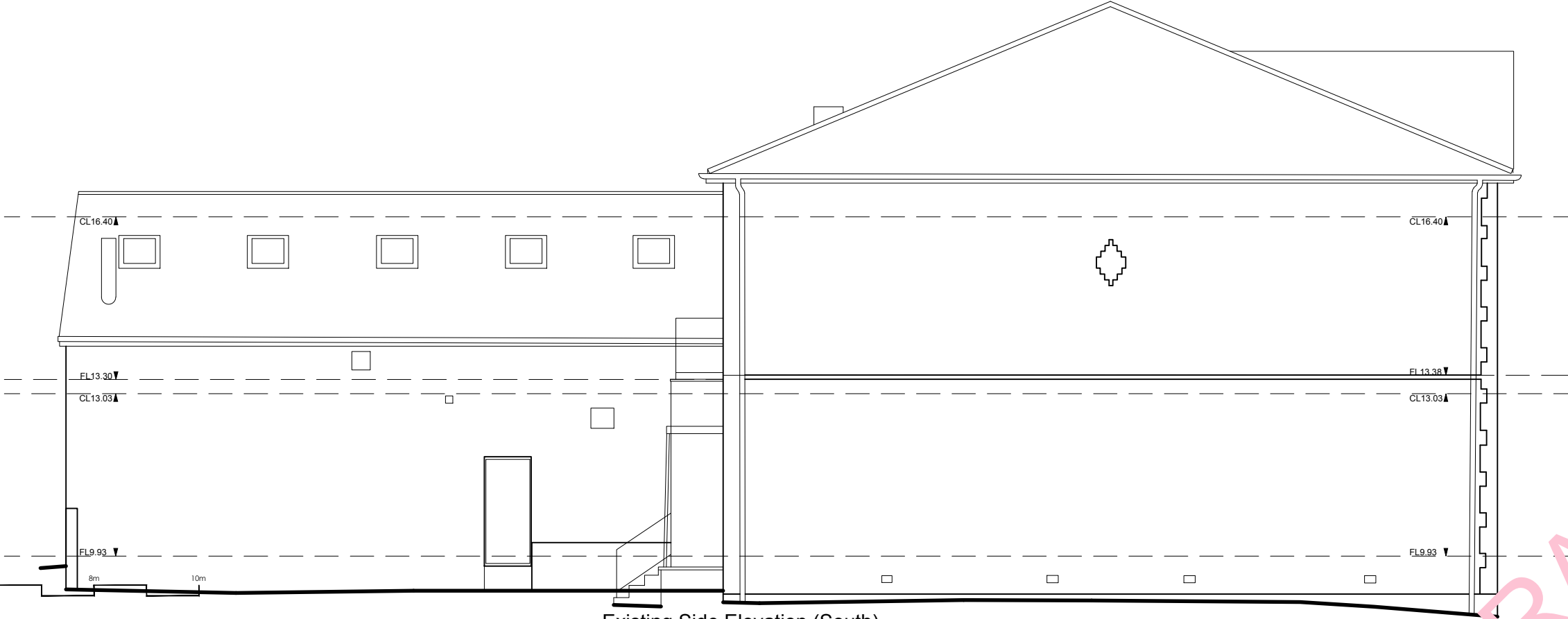
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rev A	03/07/24	existing first floor alterations further to client instructions

client	date	
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Roof- PROPOSED	398(PI)032	SP
status	job no	revision
Planning	398	*

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Existing Front Elevation



Existing Side Elevation (South)

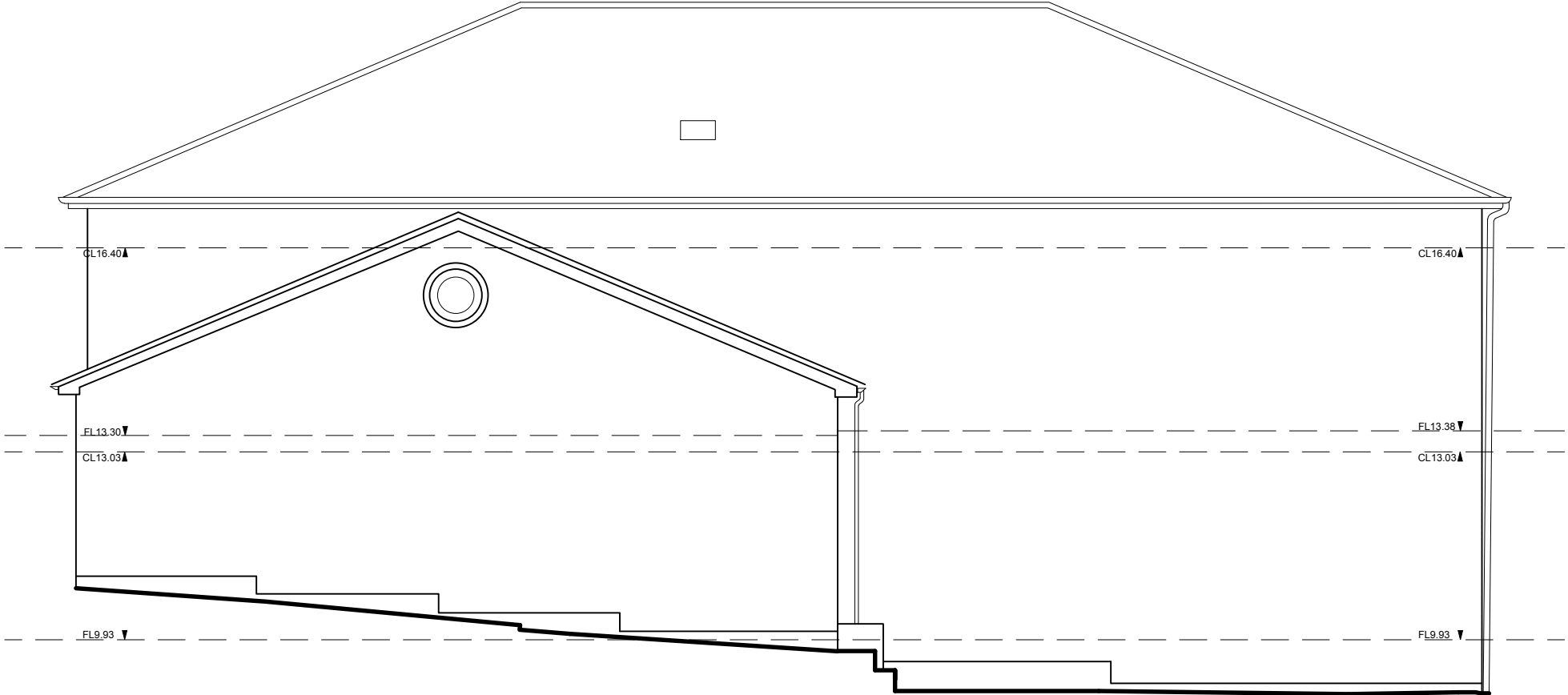
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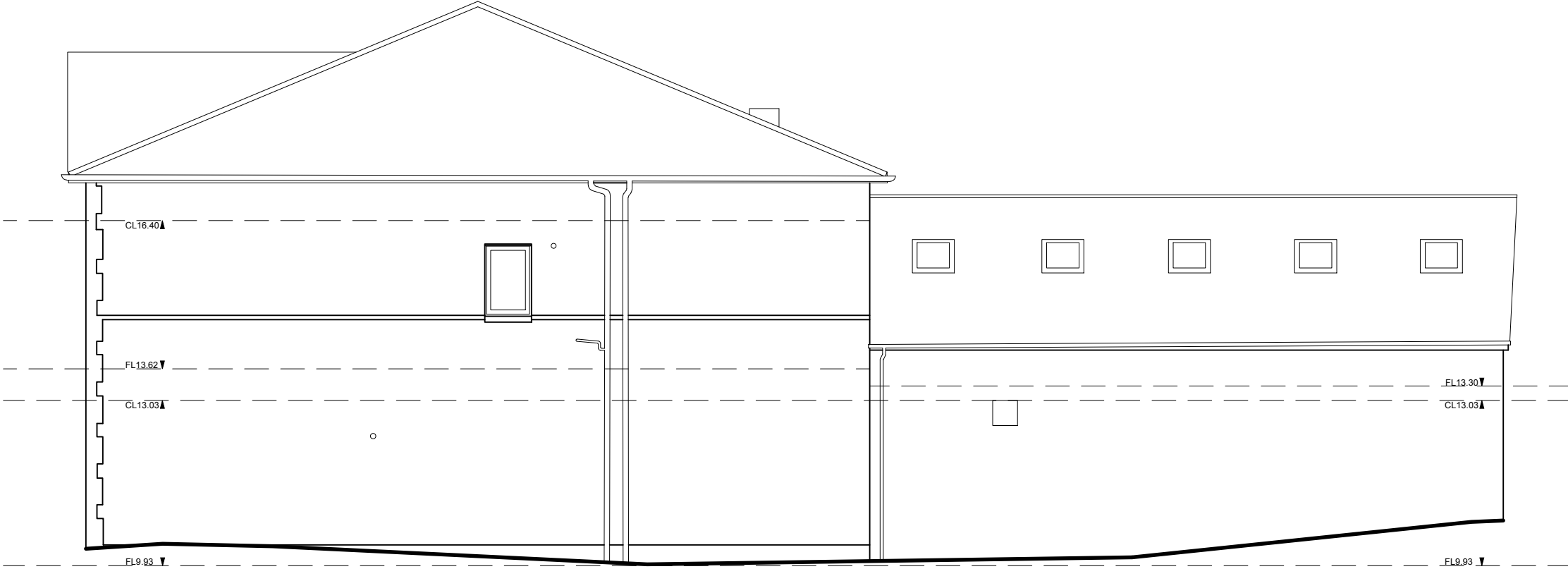
revisions

client	SHR property management ltd	date	09/08/2024
project	Unicorn House, Cheetham Rd, Middleton, Manchester M24 4DG	scale	1:100 @ A3
title	Front & Side (South) Elevations- EXISTING	drawing no	398(PI)040
status	Planning	checked by	SP
		revision	*

Notes;
A measured survey was carried out and provided by others. Existing floor layouts, roof plan and elevations provided in CAD and PDF format dated 01/04/2024



Existing Rear Elevation (West)



Existing Side Elevation (North)

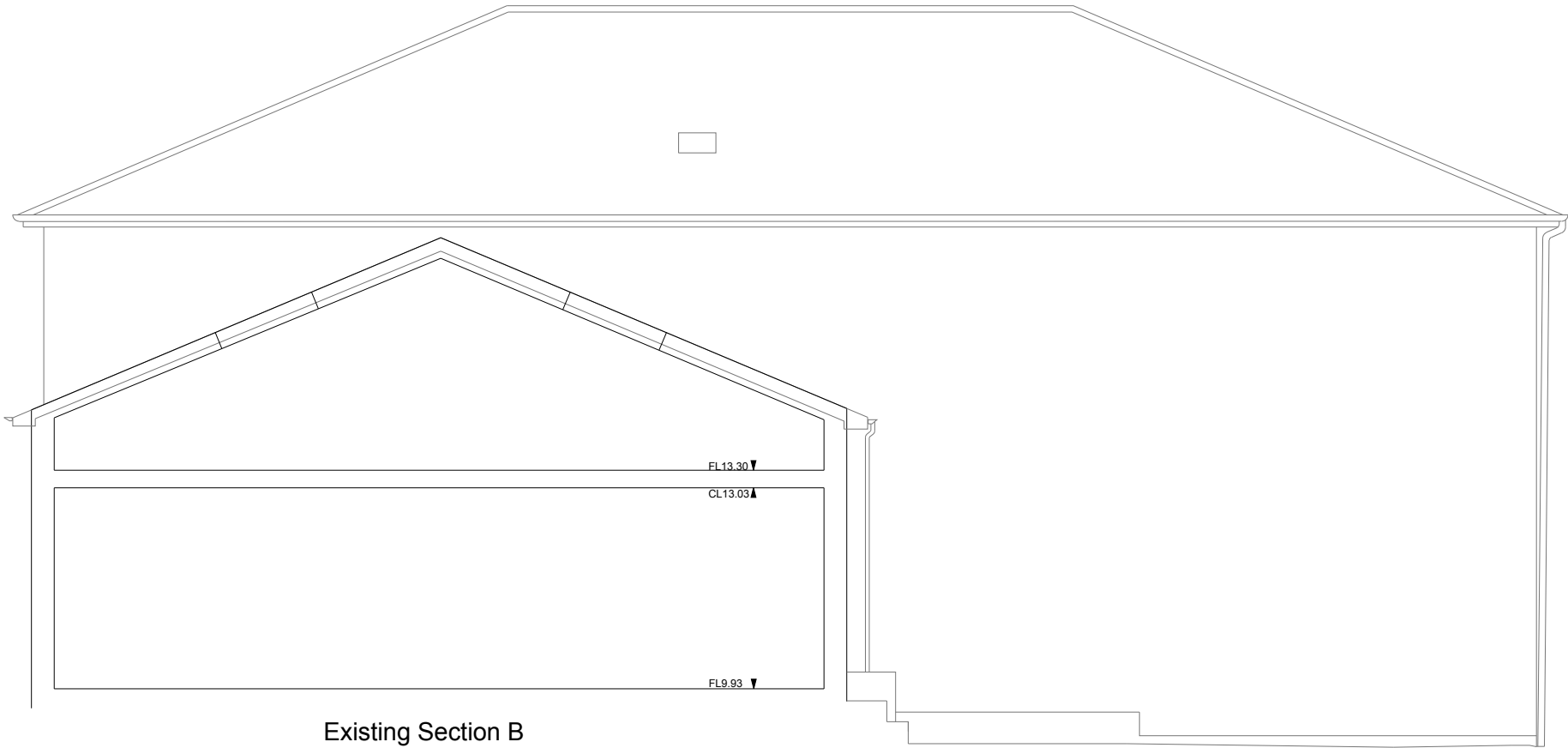
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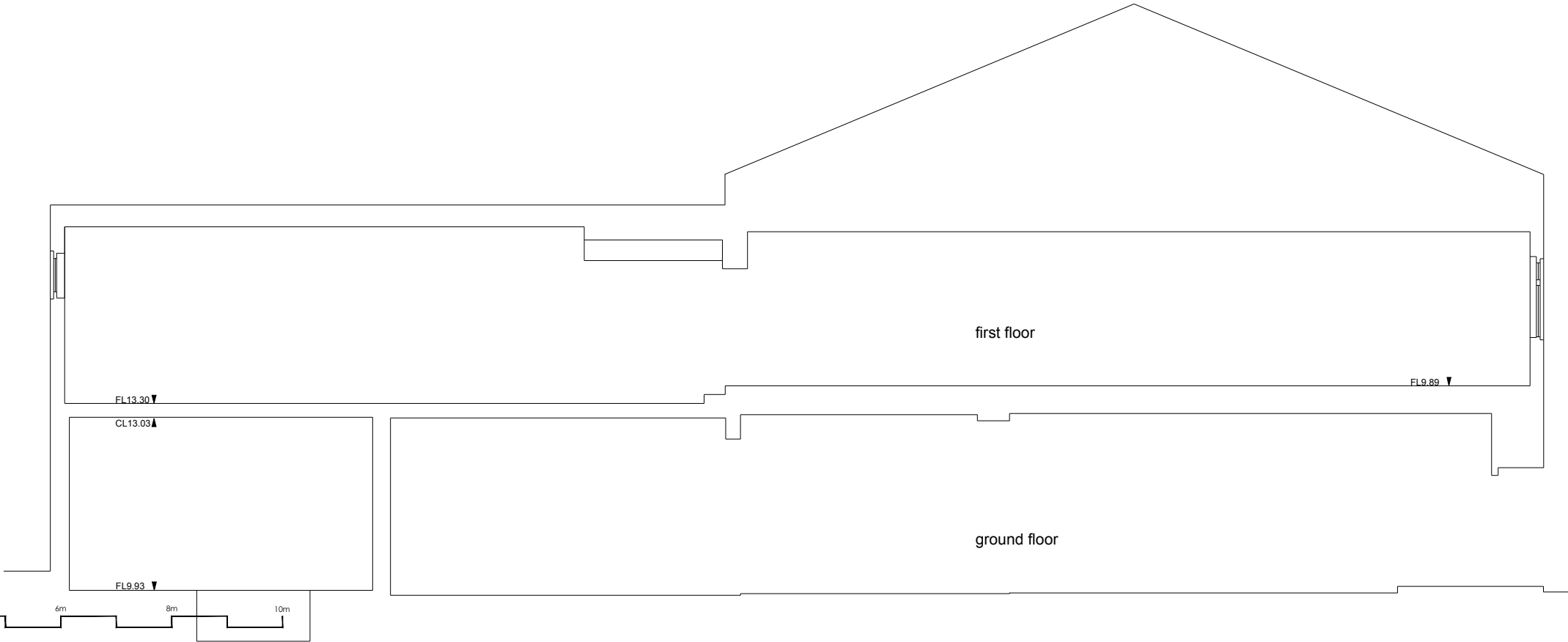
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client	SHR property management ltd	date	09/08/2024
project	Unicorn House, Cheetham Rd, Middleton, Manchester M24 4DG	scale	1:100 @ A3
title	Rear & Side (North) Elevations- EXISITING	drawing no	398(PI)041
status	Planning	checked by	SP
		revision	*

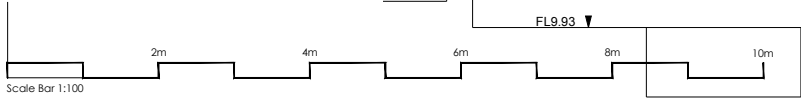
Notes;
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Existing Section B



Existing Section A



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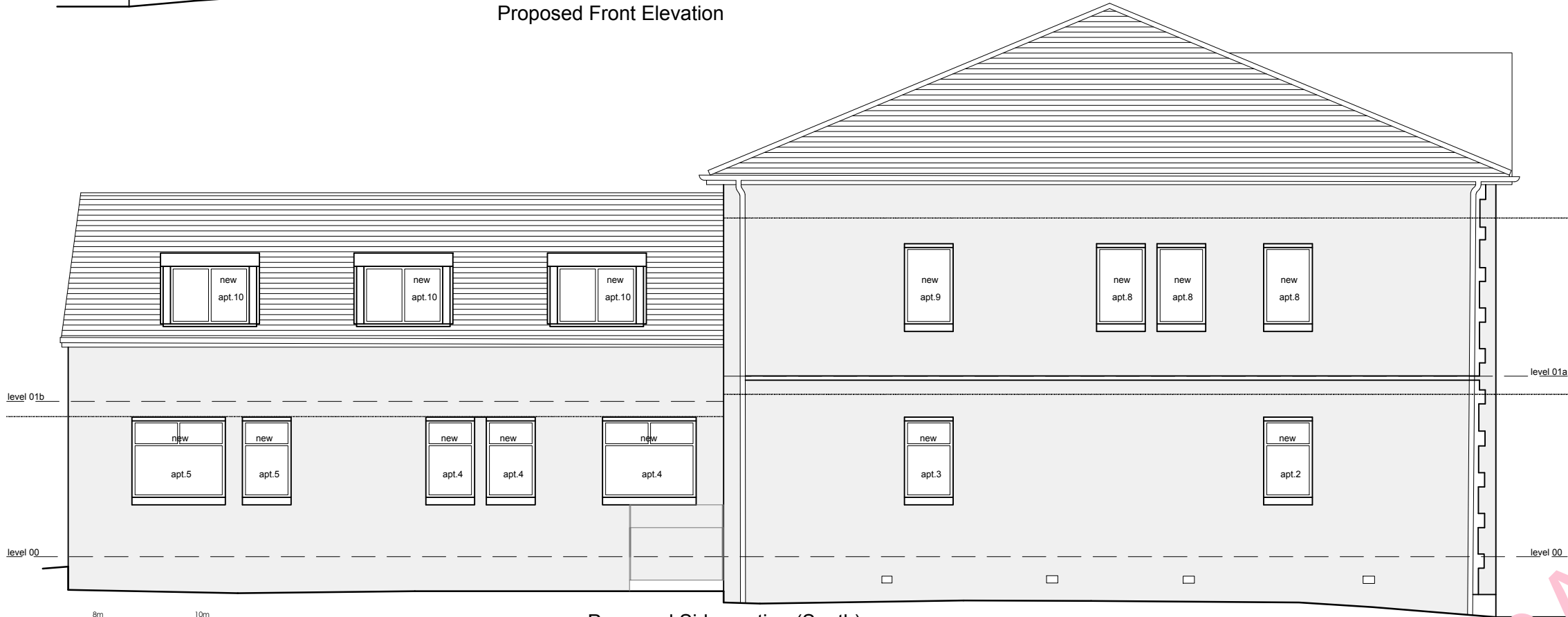
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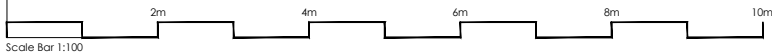
client	date	
SHR property management Ltd	09/08/2024	
project	scale	drawn by
Unicorn House, Cheetham Rd, Middleton, Manchester M24 4DG	1:100 @ A3	ML
title	drawing no	checked by
Cross Sections- EXISTING	398(PJ)042	SP
status	job no	revision
Planning	398	*



Proposed Front Elevation



Proposed Side evation (South)



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project	Unicorn House, Cheetham Rd, Middleton, Manchester M24 4DG		scale	1:100 @ A3	drawn by ML
title	Front & Side (South) Elevations- PROPOSED		drawing no	398(PI)050	checked by SP
status	Planning		job no	398	revision *



Proposed Rear Elevation (West)



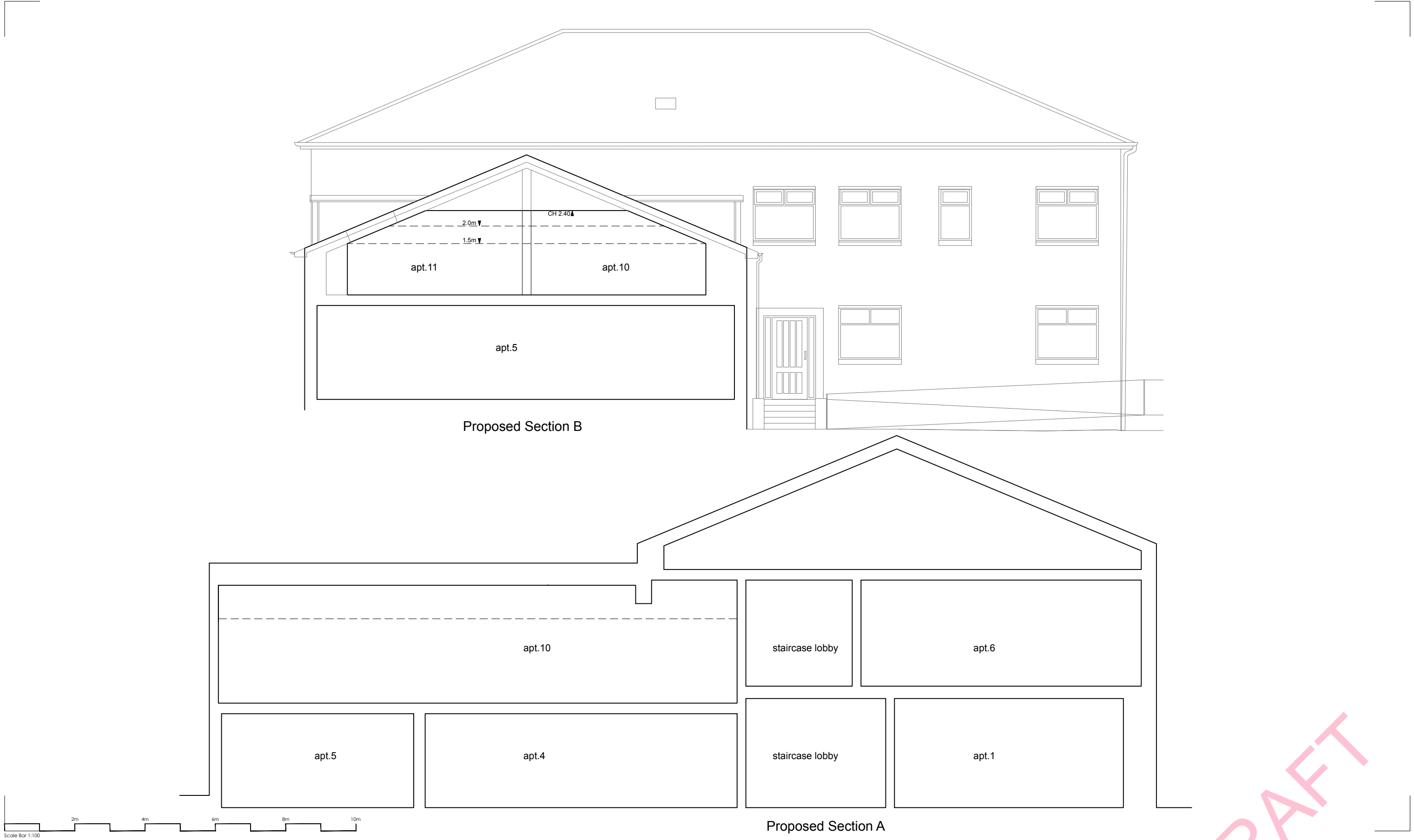
Proposed Side Elevation (North)

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project	Unicorn House, Cheetham Rd, Middleton, Manchester M24 4DG	scale	1:100 @ A3
title	Rear & Side (North) Elevations- PROPOSED	drawing no	398(PI)051
status	Planning	checked by	SP
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revisions

client	date	
SHR property management ltd	09/08/2024	
project	scale	drawn by
Unicorn House, Cheetham Rd, Middleton, Manchester M24 4DG	1:100 @ A3	ML
title	drawing no	checked by
Cross Sections- PROPOSED	398(PI)052	SP
status	job no	revision
Planning	398	*



UNICOM HOUSE
CHEETHAM ROAD
MIDDLETON
M24 4DG

DESIGN & ACCESS STATEMENT

DRAFT
AUGUST 2024
SPARCHITECTS
1998/DAS-09.08.2024

DESIGN & ACCESS STATEMENT



Aerial photograph of the existing building last used as a gym facility

This Design and Access Statement should be read in conjunction with the following documents;

Architectural Drawings
Manchester Core Strategy (Adopted 2012)
Paul Butler Associated – Planning Report Document

August 2024
prepared by SP Architects

On behalf of
SHR Property Management Ltd

398/DAS-09.08.2024

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Front elevation of the existing building along Cheetham Street

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- 1.4 Existing Building
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- 4.1 Case Study 1 – Chapel Street, Preston
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1.0 INTRODUCTION

4

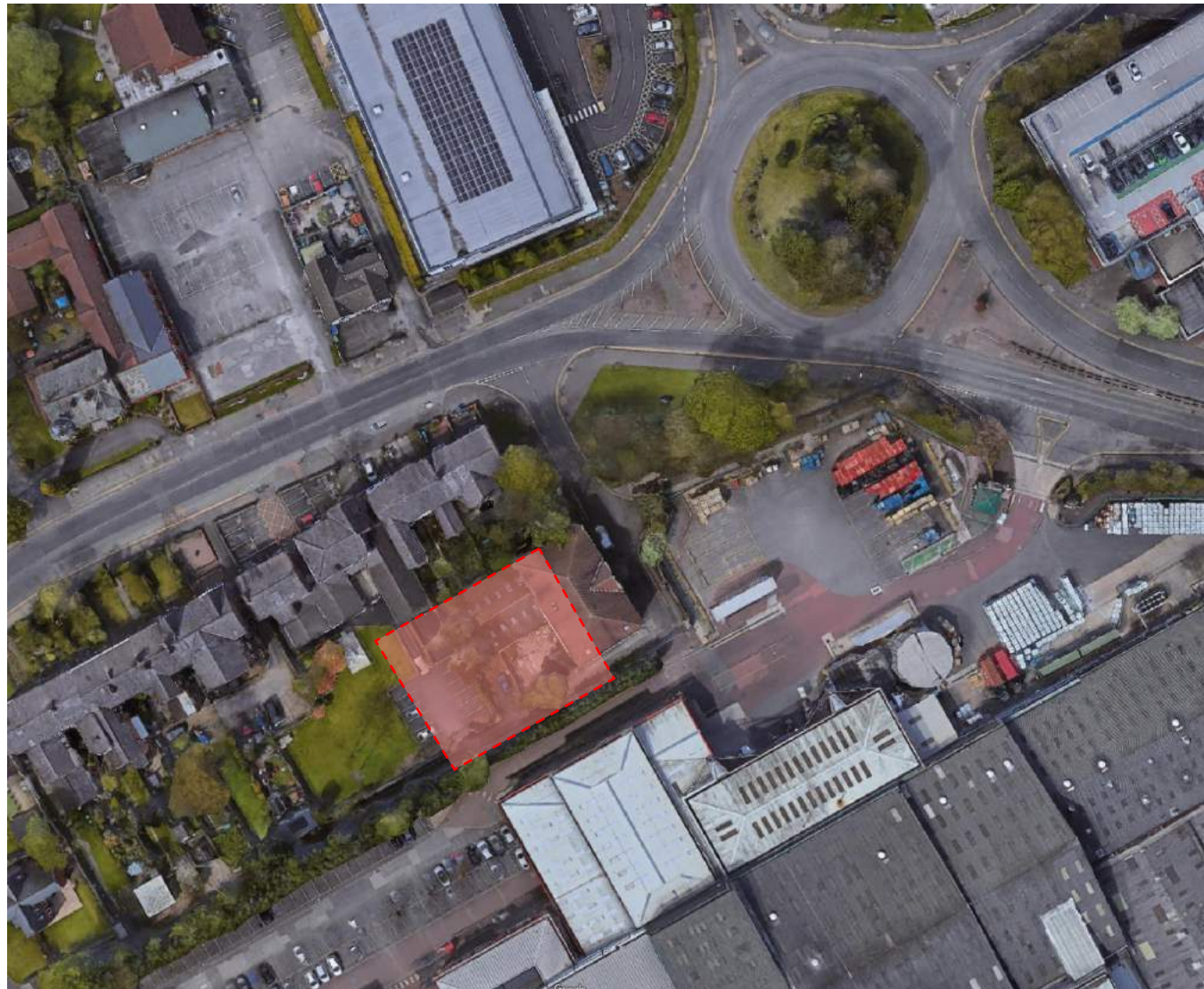
1.1 SITE LOCATION & CONTEXT

The site is located in Middleton in the Metropolitan Borough of Rochdale in Greater Manchester. Relative to Manchester City Centre, Middleton is slightly East of North above the M60 ring road.

The site is very close to the central shopping zone of Middleton and is within walking distance of Aldi and Tesco Supermarkets and also Middleton Arndale shopping centre.

The Middleton bus interchange is approximately 150m walking distance from the site. By car the site is just over 1km from Junction 19 of the M60 ring road.

The site is located within a mix of light industrial, retail and residential buildings and is accessed from Cheetham Street off the A576, which connects to the M60.



Aerial plan photograph of the site





Aldi Supermarket viewed from Cheetham Street



View of terrace of houses fronting A576 next to Cheetham St.



View from front entrance of existing site building towards Aldi



View from A576 down Cheetham Street towards frontage of site

1.2 LOCAL AREA

The surrounding buildings are of mixed architectural styles and materials. The site is bounded to the South by a large light industrial complex housing, the McBride company which manufactures and distributes cleaning products as its main business.

Middleton has a population of around 43,000 people and whilst not in conservation area the town has a rich historic heritage including fine buildings such as the Victorian Warwick Mill, previously a cotton mill close to the site in the City Centre.

The immediate area to the North and East of the site is dominated by the main road system of the A576 which distributes traffic via three roundabouts from the M60 into Middleton.

The outskirts of Middleton are largely suburban residential areas with a mixture of terraced, semi detached and detached housing.

The closest railway station to the site is Mills Hill which is approximately 2km to the east of the city centre. This connects to Manchester Victoria Station.

A wide range of bus routes are serviced from the Bus interchange close to the site. There are plans to connect Middleton to the Metrolink tram network, but the timescale for this is unknown at the present time.

1.0 INTRODUCTION

6



The open area to the South West of the existing building



The main roof section to the right / the lower roof section to the left



Access road off Cheetham Street to the rear of the site



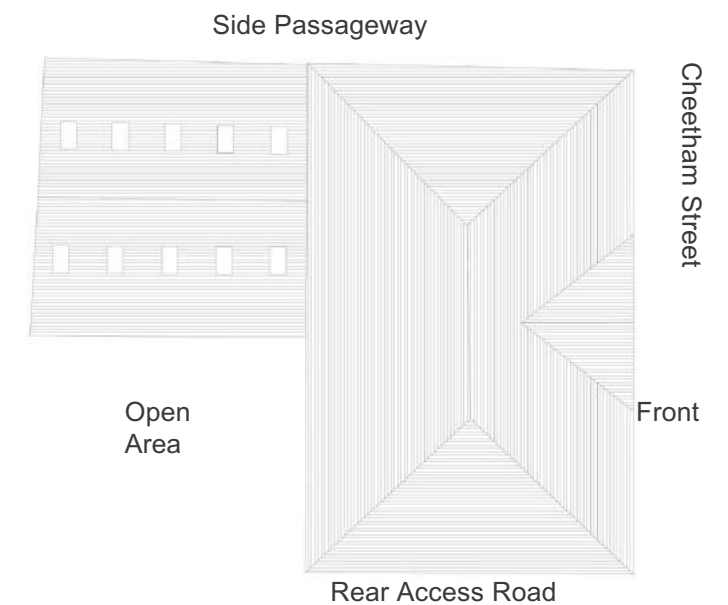
The open space behind fence also included in site

1.3 SITE DESCRIPTION

The main roof of the existing building on the site faces Cheetham Street and a lower roof section to the rear of the site forms an L shape building. The overall site area is 920.0 sqm.

The existing open spaces around the site are partially tarmac or hard standing in the process of becoming overgrown with various trees, shrubs and grasses.

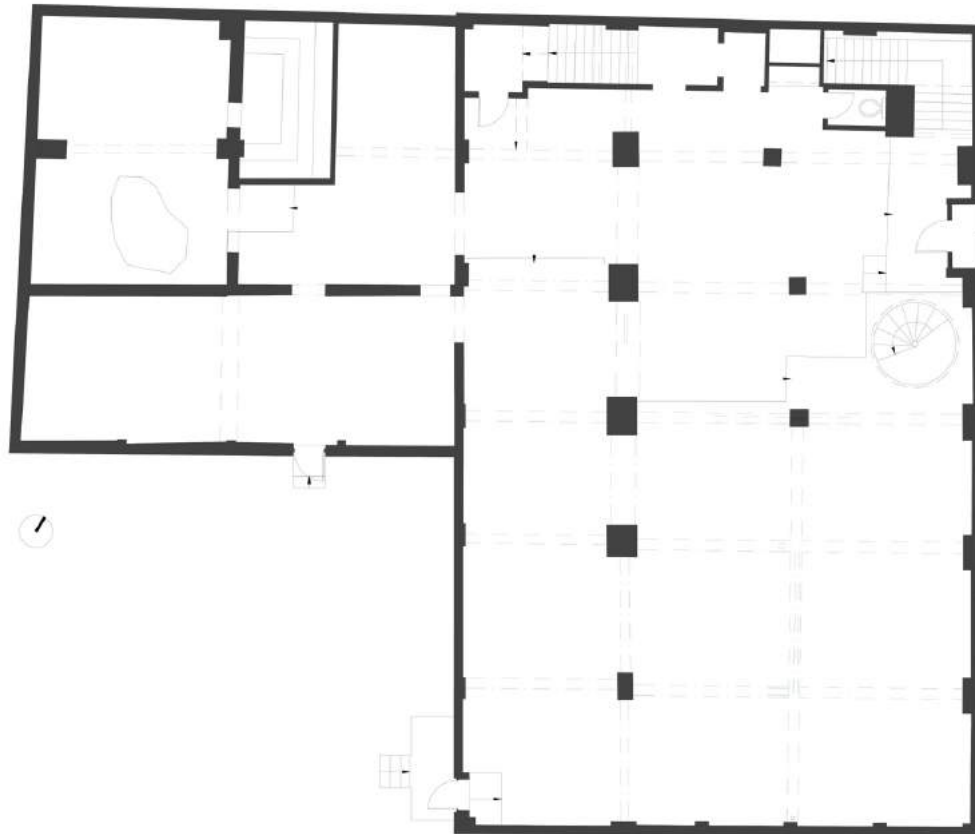
A tarmac access leads from Cheetham Street to access the rear of the site and also a car park serving the medical centre next to the site as well as the rear of terraced properties fronting the A576.



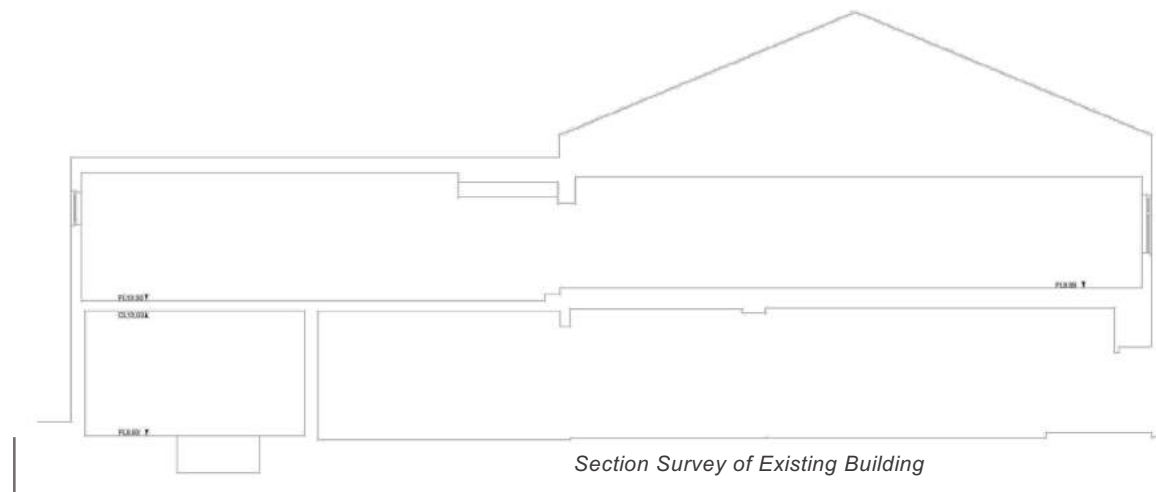
Existing Roof Plan showing Main roof to the right and lower side roof to the left

1.0 INTRODUCTION

7



Ground Floor Survey of Existing Building



Section Survey of Existing Building

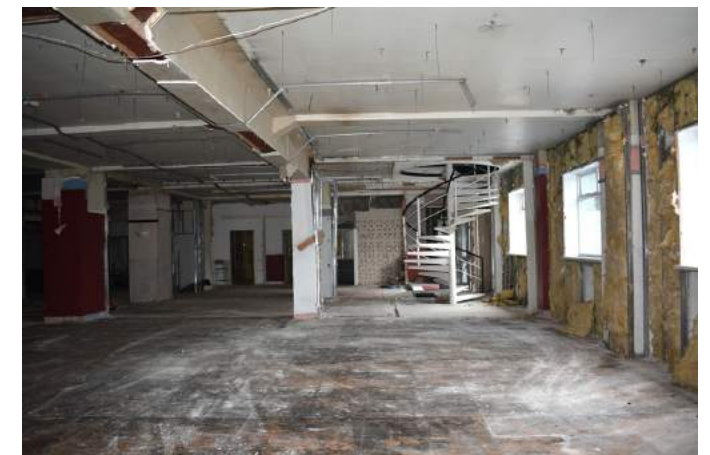
1.4 EXISTING BUILDING

The existing building is two stories with a total Gross Internal Floor Area of 921.8 sqm. The building has a steel frame structure in the main section. Both ground and first floor have recently been partially stripped out to reveal large open spaces interrupted by encased columns.

Externally the building has coloured rendered walls with minimal brick detailing and a concrete tiled roof. Existing windows are in blue powder coated aluminum to match blue eaves. Soffits, downpipe, external doors and fire escape.

The existing ground floor is largely on one level, but the first floor is split between three different levels.

Existing stairs enable access to the first floor and a feature spiral staircase from the gym fit out remains. Floor levels, building access points and horizontal and vertical circulation are all to be reconfigured in our proposals.



Ground Floor open space



Aerial View of the Existing Building on the site



Some features of the previous gym fit out remain



A partial internal strip out of the building has been



External Space to the rear of the building

1.5 CURRENT STATUS OF PROJECT

Currently the vacant site is owned by SHR Property Management Ltd who have appointed SP Architects to progress a design for the conversion of the existing building to eleven apartments and the provision of on site car parking along with other associated amenities.

At present the building has been partially stripped, though some features from the previous gym usage remain.

Further to the commissioning of building measured and structural survey, design proposals have been prepared which forms the basis for the Planning application submission. For information on the planning aspects of the application please refer to Planning Statement by Paul Butler Associates accompanying the submission.

A report by a BNG registered ecologist accompanies the application prove that an increase of Biodiversity Net Gain 10 percent can be delivered on the site for 30 years.

The application is being submitted on behalf of SHR Property Management Ltd.



Middleton relative to Manchester City Centre

Middleton Bus Interchange

1.6 SITE CONNECTIVITY

Walking

The main shopping area is in approximately 500m walking distance from the site, most of the rest of Middleton including the closest railway station is less than 2km walking distance.

Bus / Coach

The recently completed Middleton bus interchange provides a variety of routes for Manchester and further afield. The interchange is fully disabled accessible.

Train

The closest station Mills Hill is approximately 2km from the site to the east side of Middleton. Trains from Mill Hill frequently link with Manchester Victoria Station.

Car

Cheetham Street discharges onto the A576 which links directly to the adjacent main shopping area and nearby supermarkets. Junction 19 of the M60 ring road is approximately 2km from the site

Air Travel

To drive from the site to the airport is 22 miles and depending on traffic approx. 25 to 45 mins. Public transport routes from the site will take between 1hr 15min and 1hr 45 min

Wheelchair

Level access is possible from the car park entrance to the building. Pavements in the area have dropped curbs and crossing points link with the main shopping area close by and also the bus interchange.



View of immediate surrounding area from the top of Cheetham Street – Aldi Supermarket to left roundabout ahead



View from A576 showing Cheetham Street entrance to site

1.7 PLANNING CONTEXT.

The site falls under the jurisdiction of Rochdale MBC Planning Department.

For more information regarding the Planning aspects of the proposals, please refer to the document by Paul Butler Associates, Planning Consultants, accompanying the application.

Although having a rich historic heritage, the immediate area around the site is not a conservation area.

The main reference document we have referred to for planning guidance is the 'Manchester Local Development Framework Core Strategy Development Plan Document' which was adopted in July 2012.

Care has been taken in the preparation of the design to positively respond the relevant areas of guidance in the Core Strategy

Currently the area around the site has a large mixture of different styles and materials. There is no dominant style or universal use of a limited material pallet.

The proposed scheme provides eleven new apartments by the conversion of a derelict building close to the main centre of Middleton. The location of the site and the fact that an existing building is being usefully re purposed, means that the proposals provide much needed housing in a way that is sustainably viable.



2.1 PROPOSED WORKS

The proposed scheme involves the reconfiguration and compartmentation of the building on both floors to provide a total of eleven flats.

The main entrance has been repositioned and an protected corridor link created through the building at ground floor level providing wheelchair access to the new car park at the rear of the building via an new ramp.

The main protected lobby at ground floor links to a 1hr protected vertical core circulation zone containing an ambulant disabled staircase.

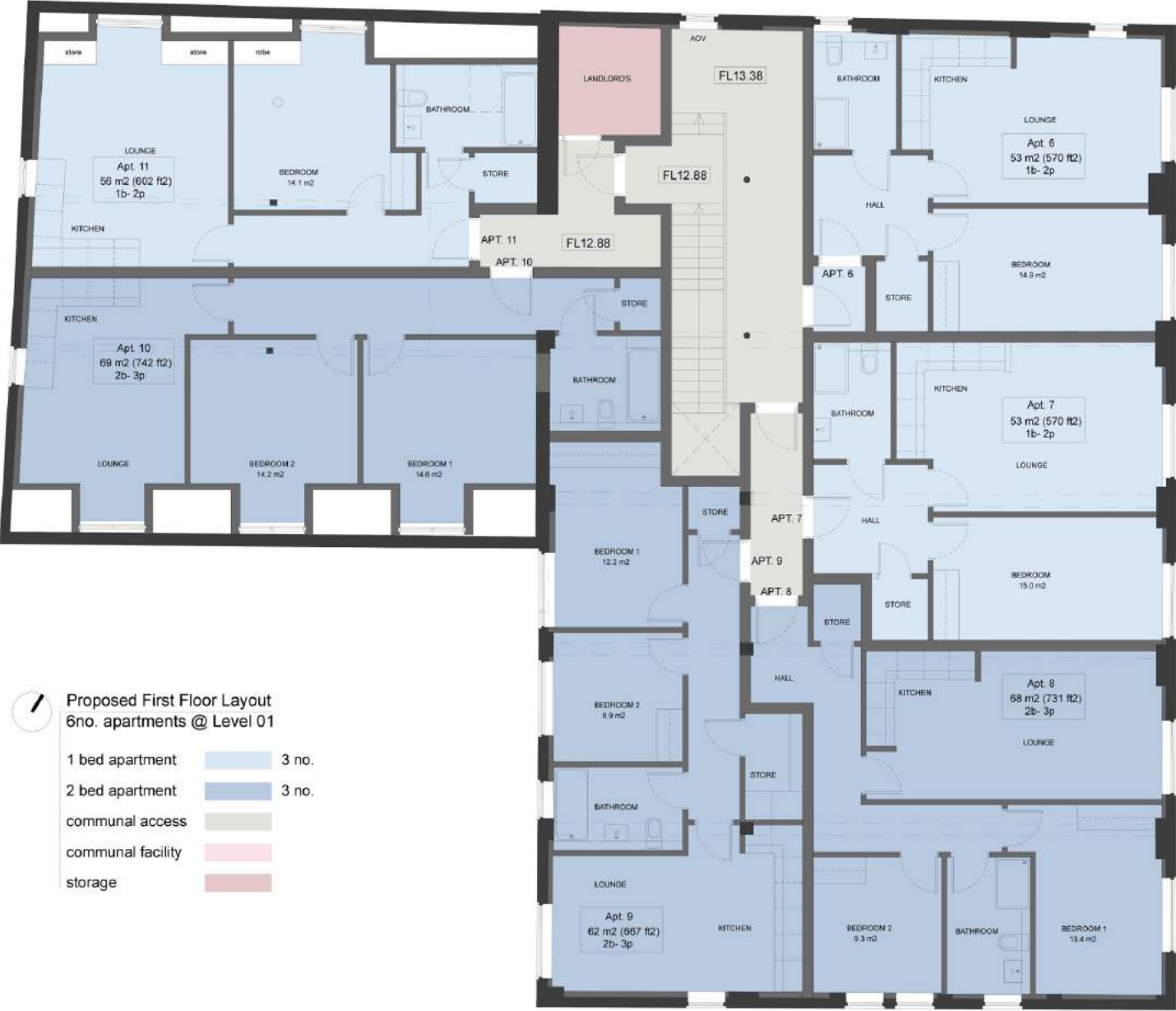
This core also links to ancillary areas; meter room, cleaners store and cycle store as well as providing an emergency fire exit to the pathway on the north side of the building.

A library / office space is also provided at ground floor. Post and deliveries are distributed in the building from a post room off the main entrance corridor.

The entrance from the car park provides wheelchair access and the spaces on the ground floor have been sized to comply with disability access standards.

The whole ground floor is level access throughout and care has been taken to design around the encased columns.

At first floor level area of the existing floor has proposed to be dropped to give more balanced ceiling heights within flats 10 & 11 to comply with Technical Housing Standards.



2.2 DESIGN PHILOSOPHY

The decision to renovate the existing building to provide much needed residential accommodation in a prime location with excellent transport connectivity gives a strong sustainability rationale to the proposal.

The proposed compartmentation of the floors provide a satisfactory balance of one and two bedroom apartments, to satisfy housing space standards and create disabled accessibility at ground floor.

We aim to keep the existing external features of the building and match new openings to existing.

However we are proposing to create a more subtle colour balance between render colour and eaves / windows colour.

2.0 PROPOSED

LEVEL	GI (m2)	GI (ft2)
Level 00	458	4,929
Level 01	463	4,983
TOTAL GI	921	9,913

LEVEL	UNIT	NI (m2)	NI (ft2)
Level 00	Apt. 1 (2 bed, 3p)	78	839
Level 00	Apt. 2 (1 bed, 2p)	56	602
Level 00	Apt. 3 (1 bed, 2p)	53	570
Level 00	Apt. 4 (1 bed, 2p)	54	581
Level 00	Apt. 5 (2 bed, 3p)	61	656
Level 01	Apt. 6 (1 bed, 2p)	53	570
Level 01	Apt. 7 (1 bed, 2p)	53	570
Level 01	Apt. 8 (2 bed, 3p)	68	731
Level 01	Apt. 9 (2 bed, 3p)	62	667
Level 01	Apt.10(2 bed, 3p)	69	742
Level 01	Apt.11(1 bed, 2p)	56	602
TOTAL NI		663	7,136

Schedule of Accommodation

Table 1 - Minimum gross internal floor areas and storage (m²)

Number of bedrooms(b)	Number of bed spaces (persons)	1 storey dwellings	2 storey dwellings	3 storey dwellings	Built-in storage
1b	1p	39 (37) *			1.0
	2p	50	58		1.5
2b	3p	61	70		2.0
	4p	70	79		
3b	4p	74	84	90	2.5
	5p	86	93	99	
	6p	95	102	108	
4b	5p	90	97	103	3.0
	6p	99	106	112	
	7p	108	115	121	
	8p	117	124	130	
5b	6p	103	110	116	3.5
	7p	112	119	125	
	8p	121	128	134	
6b	7p	116	123	129	4.0
	8p	125	132	138	

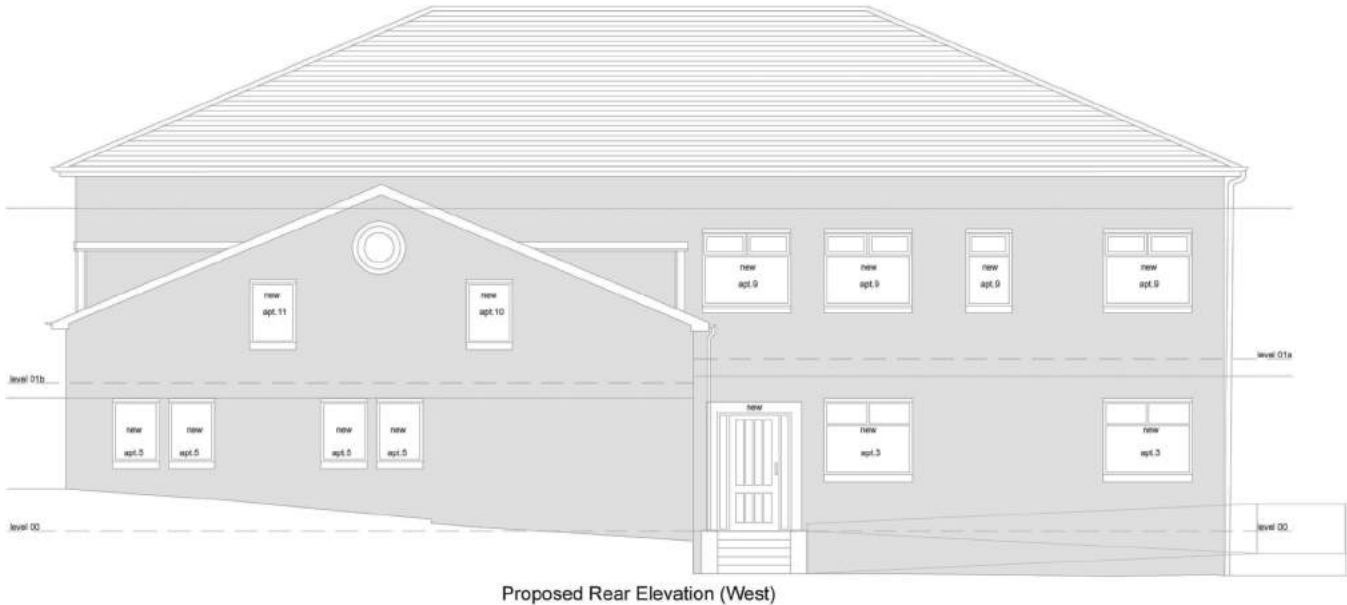
Technical housing standards – Nationally Described Space Standard

2.3 ACCOMMODATION

At ground floor there are three 1 bed and two 2 bed apartments and at first floor level three 1 bed and three 2 bed. This gives a total of eleven apartments five at ground floor and six at first floor.

The ground floor flats have enhanced space provision for disabled access.

Care has been taken to ensure the proposed scheme is compliant with the Technical Housing Standards (March 2015).



2.4 ELEVATIONAL TREATMENT

The existing building has rendered walls and a concrete tiled roof. The windows, doors, eaves and soffits are painted a strong blue colour. There is also some quoin and brick course detailing. As far as possible, we aim to make the proposals harmonise with the existing buildings. New openings and windows will be proportioned to match existing. Due to the extent of new openings being created, we intend to re render the building with a self pigmented product in white or off white (final tone to be agreed.)

To compliment the new render tone, we propose to paint the existing windows, eaves and soffits dark grey. New doors and windows will the in UPVC dark grey to match. All brick detailing and features will be preserved. The fire escape at the rear of the building will be removed to allow the remodeling of the side elevation.



Front Elevation showing existing building materials



The present building envelope



The present biodiversity consists of naturally colonized plants and trees

2.5 SUSTAINABILITY

Sustainability has been considered from the outset of the project, and was the primary rationale to redevelop the existing building rather than demolish and rebuild.

The existing building envelope represents a significant amount of embodied energy in terms of the energy required to manufacture and transport materials. As far as reasonably possible the project team wish to encourage the responsible sourcing of materials and products. Materials will be sourced locally where possible to minimise transportation.

Building waste will be reduced as far as possible with unwanted waste being recycled locally where possible The envelope of the building will be upgraded to current energy statutory requirements.

2.6 BIODIVERSITY

New regulations require the development to enhance biodiversity by 10 percent and maintain that level of enhancement for 30 years.

The Client has appointed a Biodiversity Net Gain qualified ecologist to assess the current site and propose a set of measures to satisfy and if possible exceed the Biodiversity Net Gain requirement.

There are standard methods of measuring biodiversity on a site. The appointed ecologist will provide a report containing the necessary calculations to accompany the planning application and to support the case that the BNG requirement has been satisfied.



Ground Floor Plan in the Context of the Site showing new entrances to the building



3.1 SITE AND BUILDING ACCESS

The site is serviced by Cheetham Street, which joins the A576, which in turn connects to the M60 at Junction 19 about 2km away.

The front entrance to the proposed scheme opens onto Cheetham Street. Level access is provided from the car park at the rear of the building via a new ramp. The access to the upper floor flats is provided via new ambulant disabled staircase in accordance with Part M of the Building Regulations.

At the bottom of Cheetham street a tarmac access road allows vehicular access to the proposed car park at the rear of the building providing eleven spaces at a ratio of 1 space per flat.

Door entry systems will be installed to allow entry to visitors and postage / deliveries. Post is distributed in the building from the post room off the main entrance corridor.

Fire fighting vehicles would park on Cheetham Street or the rear access road. A fire exit from the north side of the building discharges to the path outside, which in turn links to Cheetham Street.

Access for bin collection is through the car park to the rear access road. The turning head on Cheetham Street would allow reverse access to the car park.

4.0 ACCESS AND SERVICING



Aerial View of the Site



Tarmac Road Access to Rear of the Site



3.2 SERVICING OF BUILDING

Most deliveries to the building will be made to the front entrances from Cheetham Street. Visitors will be able to access from either the front entrance or the car park entrance via a door entry system.

3.3 CAR PARKING & CYCLE STORE

The car park at the rear of the scheme provides 11 No. on site car parking spaces. Each space is 2.4m by 4.8m with a min reversing space of 5.8m.

Two of these spaces are disabled and abut the southern elevation of the building. Hence the provision is one space per flat.

The cycle store at ground floor level is located in the building close to the fire exit discharging to the path to the north side of the building and has capacity for 11 cycles at ratio of 1 per flat.

3.4 WASTE MANAGEMENT

The waste management strategy for this project has been formulated in accordance with GD 04 Waste Storage and Collection Guidance for New Developments Manchester City Council'.

The proposed bin store is located to the rear of the car park and provides 4 No 1100L and 4 No. Wheeled Bins 240L in accordance with national guidelines based on the number of bed spaces.

4.0 CASE STUDIES



Interior After Strip Out



Front Elevation

4.1 CASE STUDY 1 CHAPEL STREET, PRESTON

Designed by SP Architects and now completed and fully occupied, our project at Chapel Street, Preston is very similar in it's design approach as Unicom House.

The existing building was stripped and it's envelope was upgraded both thermally and acoustically. The project created fourteen apartments.

Working within the restrictions of an existing building in a conservation area is challenging. Some parameters can be changed, but others such as the structure, the floor height and the position of existing stair wells are fixed.

Within these constraints we worked to achieve the required acoustic, thermal, fire and structural performances, whilst delivering highly desirable dwellings within Preston City centre.



Proposed First Floor Plan

4.0 CASE STUDIES



Proposed First Floor Plan



Aerial View of Site



Street View of Building

4.1 CASE STUDY 2 FOUNTAIN STREET, MIDDLETON

Rochdale Council Application Reference
20/01382/PRA56

Prior approval for change of use of vacant offices
(Use Class B1) to 8 no. apartments (Use Class C3) |
Former Rochdale Council Offices Fountain Street
Middletton M24 1AF.

Date of Application: 2 December 2022

Proposal: Prior approval for change of use from
commercial use (Class E) to Dwelling house (Class
C3) (6no apartments)

Location: First Floor Midway House, Fountain
Street, Middleton, M24 1AF



Site Location Plan

Appendix B



Rainfall runoff calculations

Input parameters for run-off calculations	
Country	England
Total site area	959.77 m^2
Area proposed for development	960 m^2
Current permeable ground cover	136 m^2
Current impermeable ground cover	824 m^2
Proposed permeable ground cover	80.506 m^2
Proposed impermeable ground cover	879.202 m^2
Urban Creep Allowance	10%
Final impermeable ground cover	959.77 m^2
SPR	0.47
SAAR	1023 mm
Region	10
Climate change factor	45%
Discharge Rate (l/s)	2.0
Run-off coefficient	100%

Current impermeable area as % of total	86%
Proposed impermeable area as % of total	100%
Change in permeable area (m2)	-55
Change in impermeable area (m2)	136
Change in impermeable area as % of total	14%

Rainfall event	Greenfield run-off rates (l/s)	Existing run-off rates(l/s)	Potential run-off rates without attenuation (l/s)	Potential minus exisiting (l/s)
QBAR	0.72	N/A	N/A	N/A
6 hour 1 in 1 year	0.61	1.04	1.17	0.13
6 hour 1 in 10 year	1.00	1.59	1.79	0.19
6 hour 1 in 30 year	1.21	2.07	2.32	0.26
6 hour 1 in 100 year	1.50	2.59	2.91	0.32
6 hour 1 in 100 year + 20% CC	N/A	N/A	3.49	0.90
6 hour 1 in 100 year + 45% CC	N/A	N/A	4.22	1.63

Rainfall event	Greenfield run-off volume (m ³)	Existing run-off volume (m ³)	Potential run-off volume without attenuation (m ³)	Potential minus existing (m ³)
QBAR	12.05	N/A	N/A	N/A
6 hour 1 in 1 year	11.39	22.41	25.18	2.77
6 hour 1 in 10 year	18.10	34.42	38.62	4.20
6 hour 1 in 30 year	22.69	44.64	50.16	5.52
6 hour 1 in 100 year	28.43	55.94	62.85	6.91
6 hour 1 in 100 year + 20% CC	N/A	N/A	75.42	19.48
6 hour 1 in 100 year + 45% CC	N/A	N/A	91.13	35.19

Return Period	Runoff rate restriction (l/s)	Critical Storm Duration (hr)	Attenuation Volume Required (m ³)	Volume required above previous return period
1 in 30 year	2.00	1	23.04	N/A
6 hour 1 in 100 year	2.00	1	31.73	8.69
6 hour 1 in 100 year + 45% CC	2.00	2	51.94	20.21

Appendix C



United Utilities Asset Location Plan

GeoSmart Information

Suite 9-11, Old Bank Buildings
Bellstone,
Shropshire,
SY1 1HU

FAO:

How to contact us:

United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

Your Ref: 83402
Our Ref: UUPS-ORD-600670
Date: 18/09/2024

Dear Sirs

Location: Unicorn House

I acknowledge with thanks your request dated 16/09/2024 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. <http://www.unitedutilities.com/work-near-asset.aspx>.

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,



Karen McCormack
Property Searches Manager

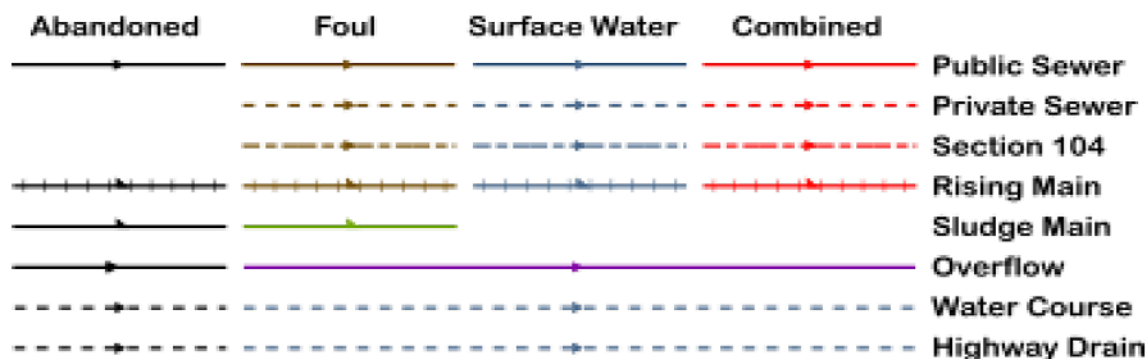
TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

TERMS AND CONDITIONS:

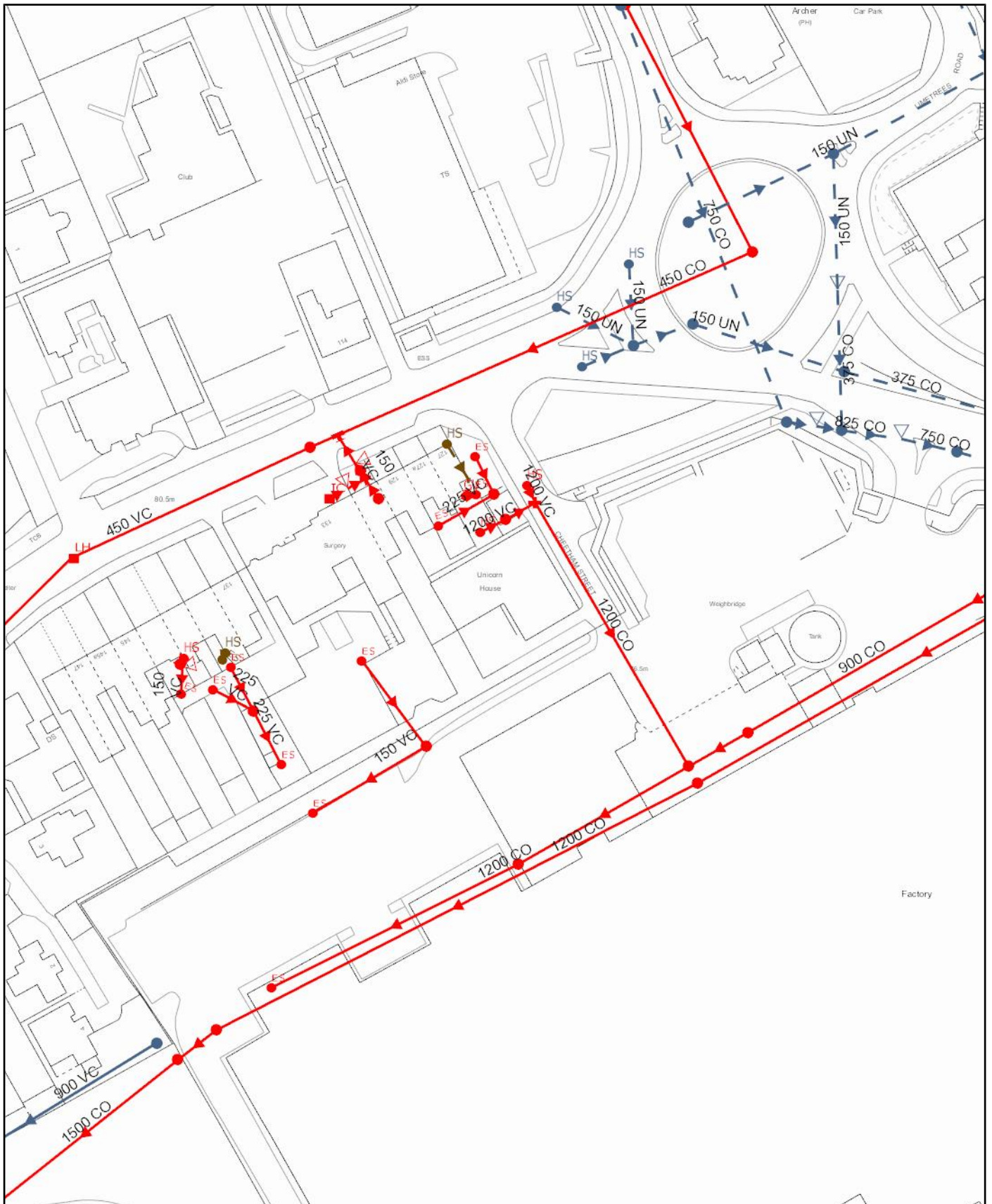
- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.

Wastewater Symbolology



All point assets follow the standard colour convention: **red** – combined **brown** - foul
blue – surface water **purple** - overflow

Manhole	Side Entry Manhole
Head of System	Outfall
Extent of Survey	Screen Chamber
Rodding Eye	Inspection Chamber
Inlet	Bifurcation Chamber
Discharge Point	Lamp Hole
Vortex	T Junction / Saddle
Penstock	Catchpit
Washout Chamber	Valve Chamber
Valve	Vent Column
Air Valve	Vortex Chamber
Non Return Valve	Penstock Chamber
Soakaway	Network Storage Tank
Gully	Sewer Overflow
Cascade	Ww Treatment Works
Flow Meter	Ww Pumping Station
Hatch Box	Septic Tank
Oil Interceptor	Control Kiosk
Summit	DNM Network Monitoring Point
Drop Shaft	Change of Characteristic
Orifice Plate	



Scale: 1:1250
Date: 18/09/2024

SEWER RECORDS



Water for the North West

Address or Site Reference: Unicorn House
Printed by: Property Searches

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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Important consumer protection information

This search has been produced by GeoSmart Information Limited, Suite 9-11, 1st Floor, Old Bank Buildings, Bellstone, Shrewsbury, SY1 1HU.

Tel: 01743 298 100

Email: info@geosmartinfo.co.uk

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The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom.
- sets out minimum standards which firms compiling and selling search reports have to meet.
- promotes the best practice and quality standards within the industry for the benefit of consumers and property professionals.
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.
- By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

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- handle complaints speedily and fairly.
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If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award up to £5,000 to you if the Ombudsman finds that you have suffered actual financial loss and/or aggravation, distress or inconvenience as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs contact details:

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk.

Please ask your search provider if you would like a copy of the search code

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- Acknowledge it within 5 working days of receipt.
- Normally deal with it fully and provide a final response, in writing, within 20 working days of receipt.
- Keep you informed by letter, telephone or e-mail, as you prefer, if we need more time.
- Provide a final response, in writing, at the latest within 40 working days of receipt.
- Liaise, at your request, with anyone acting formally on your behalf.

If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs): Tel: 01722 333306, E-mail: admin@tpos.co.uk.

We will co-operate fully with the Ombudsman during an investigation and comply with his final decision. Complaints should be sent to:

Martin Lucass

Commercial Director

GeoSmart Information Limited

Suite 9-11, 1st Floor,

Old Bank Buildings,

Bellstone, Shrewsbury, SY1 1HU

Tel: 01743 298 100

martinlucass@geosmartinfo.co.uk

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