



Flood Risk Assessment and Drainage Strategy

Project: Former Pink Drips Unit,
Sandbrook Park,
Rochdale
Option 2: Dual Lane Drive Through

Client: Stantec UK Limited

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1 INTRODUCTION

1.1 Terms of Reference

- 1.1.1 JNP Group has been commissioned by Stantec UK Limited to prepare a flood risk assessment and drainage strategy for the proposed reconfiguration of an existing retail unit to facilitate a drive-through, with a dual lane drive-through.
- 1.1.2 This report assesses flood risk at the development site from all potential sources and describes the measures adopted in the master planning process to manage such risks. It has been prepared in compliance with current policies and best practices.
- 1.1.3 This report reviews the surface and foul water drainage hierarchy and proposes a drainage strategy. It describes the surface water drainage system and identifies management and maintenance tasks for the system. It also outlines a Surface Water Construction Management Plan for drainage during construction.

1.2 Policy Framework and Key Stakeholders

- 1.2.1 The *National Planning Policy Framework* (NPPF) sets strict tests to protect people and property from flooding which all local planning authorities are expected to follow. Where these tests are not met, national policy is clear that new development should not be allowed.
- 1.2.2 The NPPF refers to the flood zones which are shown on the Environment Agency Flood Map, and establishes the range of uses which are appropriate, or comparable, land uses for each flood zone.
- 1.2.3 In decision making, local planning authorities must ensure a sequential approach to site selection and master planning is followed so that development is, as far as reasonably possible, located where the risk of flooding (from all sources) is lowest, taking account of climate change and the vulnerability of future users to flood risk.
- 1.2.4 Where development needs to be in locations where there is a risk of flooding, local planning authorities and developers must ensure development is appropriately flood resilient and resistant, safe for its users for the development's lifetime, and will not increase flood risk elsewhere.
- 1.2.5 The Environment Agency (EA) is a statutory consultee on applications where there is a risk of flooding from the sea or main rivers.
- 1.2.6 Lead local flood authorities (LLFAs) are responsible for managing local flood risk from ordinary watercourses, surface water or groundwater, and for preparing local flood risk management strategies. Local planning authorities (LPAs) work with lead local flood authorities to ensure local planning policies are compatible with the local flood risk management strategy.
- 1.2.7 Rochdale Council is the LLFA and the local planning authority (LPA).
- 1.2.8 Where relevant, local planning authorities and developers must also take advice from:

- Sewerage undertakers; to ensure they can assess the impact of new development on their assets and plan any required improvements. United Utilities (UU) is the local sewerage undertaker.
- Reservoir undertakers; to avoid an intensification of development within areas at risk from reservoir failure and ensure they can assess the cost implications of any reservoir safety improvements required due to change in land use downstream of their assets.
- Navigation authorities; in relation to developments adjacent to, or which discharge into, canals (especially where these are impounded above natural ground level).

1.3 Sources of Information

1.3.1 This flood risk assessment has been based on the following sources of information:

- Bespoke topographic survey undertaken by Survey Operations in January 2025 (Ref. 24C149;
- British Geological Survey's GeoIndex Tool;
<http://mapapps2.bgs.ac.uk/geoindex/home.html>
- DEFRA / EA's aquifer and source protection data;
<https://magic.defra.gov.uk/MagicMap.aspx>
- Cranfield University's soils data;
[\(http://www.landis.org.uk/soilscapes/\)](http://www.landis.org.uk/soilscapes/)
- FEH's catchment data;
<https://fehweb.ceh.ac.uk/>
- EA's Flood Map for Planning;
<https://flood-map-for-planning.service.gov.uk/>
- EA's Long Term Flood Risk Information;
<https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>
- Flood risk vulnerability classification
<https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification>
- Flood risk assessments: climate change allowances
<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>
- EA's Historic Flood Outlines;
<https://environment.data.gov.uk/DefraDataDownload/?mapService=EA/RecordedFloodOutlines&Mode=spatial>
<https://environment.data.gov.uk/DefraDataDownload/?mapService=EA/HistoricFloodMap&Mode=spatial>

- Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) and The SuDS Manual (2015);
- Design and Construction Guidance (DCG) for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England (May 2021);
- Strategic Flood Risk Assessment, Rochdale Council, 2009 (note maps not available on the website;
- GPR Survey, Carter Taylor, June 2026.

2 DEVELOPMENT SITE

2.1 Location

2.1.1 The site is located on Sandbrook Retail Park as shown in Figure 2.1 and Table 2.1.

Figure 2.1: Site Location

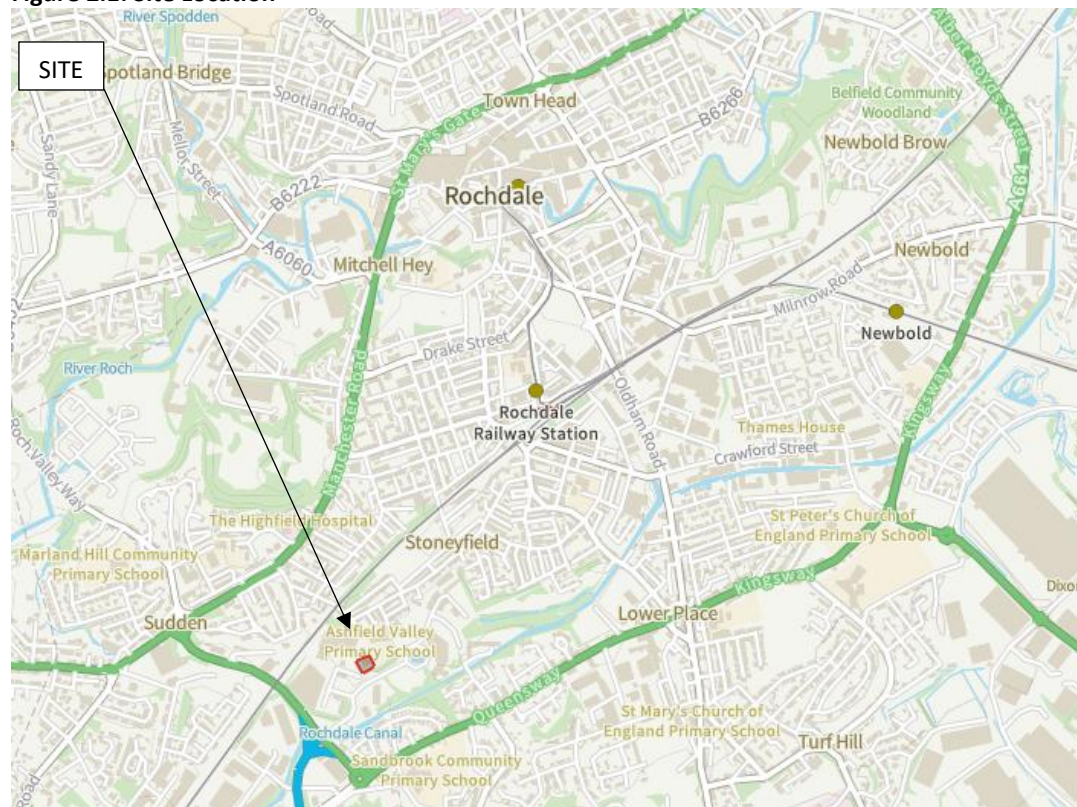


Table 2.1: Site Location

OS X	OS Y	Site Area (ha)	Nearest Postcode
389289	411772	0.22ha	OL11 1RY

2.1.2 The site is an existing commercial unit (Pink Drips) which was a food retail outlet offering a wide range of desserts and a selection of food. The unit is a single storey building mostly surrounded by car parking and associated access with limited landscaping.

2.1.3 The surrounding land uses are summarised in the following table.

Table 2.2: Surrounding Land Use

Direction	Land Use
North	Retail unit (Pizza Hut)
East	Playing field associated with school
South	Tree belt along Seaford Way with some open ground.
West	Parking and commercial units associated with the retail park

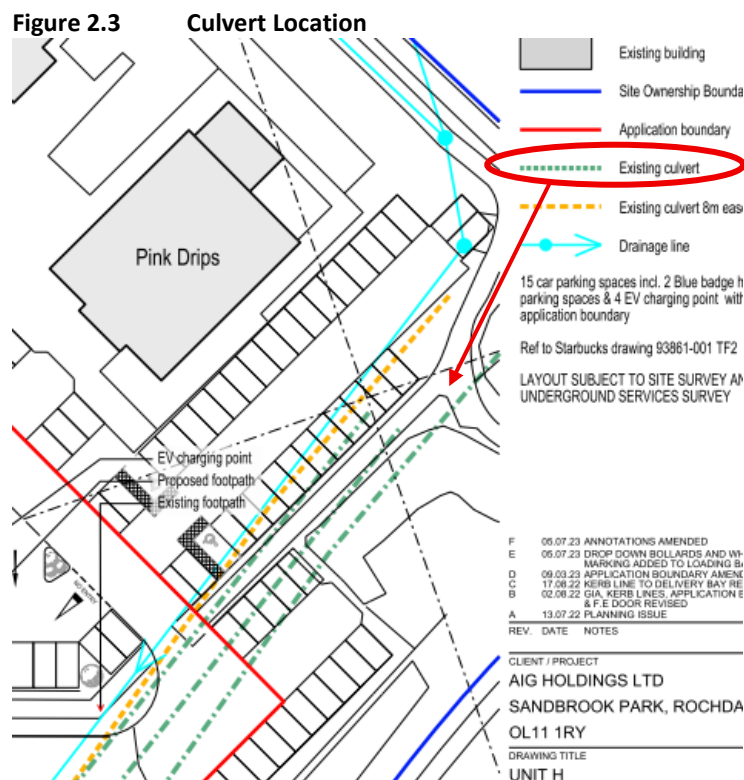
2.2 Current and historic land use

- 2.2.1 The site appears to have been part of a mill complex from the earliest map available dated 1888 to at least 1975. The maps show a watercourse orientated east to west in the vicinity of the site, culverted under the mills just to the north of the site. There was also a watercourse some way to the south of the site.

Figure 2.2 1937 to 1961 1:25,000 OS map



- 2.2.2 Google Earth shows that by 2000, the mills had been demolished, and the site was undeveloped although some of the units on the retail park had been constructed. The retail unit is shown from 2013 onwards.
- 2.2.3 The culvert beneath the site appears to have been diverted at some point to along the southeastern site boundary as shown on the plan below.



2.3 Topography

2.3.1 Regionally, the topography is falling towards the north.

2.3.2 The available topographic information is provided in **Appendix A** and shows that the site is virtually flat with changes in topography generally resulting from the landscaping. The grassed area to the north of the unit is at c. 129.6m aOD which is similar to the ground level around the unit. The south west of the site is at an elevation of c. 129.2m aOD.

2.4 Geology

2.4.1 The geology of the site has been determined by reference to the 1:50,000 scale British Geological Survey (BGS) online Geoindex Tool.

2.4.2 Made ground is indicated to be present underlying the site.

2.4.3 The superficial geology of the site to be is indicated to be Glaciofluvial Deposits, which is described by the BGS as “sand and gravel”. There is a small outcrop of Alluvium on or just to the north of the site, assumed associated with the watercourse. The BGS describe Alluvium as “clay, silt, sand and gravel”.

2.4.4 The underlying geology is indicated to be mudstone, siltstones and sandstones of the Pennine Lower Coal Measures. There are no faults close to the site.

2.4.5 JNP Group have consulted online borehole records held by the BGS. There are a number of records c. 100m to the south east but these are all confidential. There are more boreholes c. 300m to the north west. The closest borehole indicated made ground to 8.8m bgl, underlain by peat to 10.3m bgl, sand to 18.0m bgl, and silt to the base of the borehole at

20.0m bgl. The log does not assign a strata name to these deposits, from the lack of coal and consolidated strata, it is assumed these are Glaciolacustrine Deposits. Groundwater was noted at c. 8.7m bgl.

2.4.6 The EA's Aquifer Maps indicate that the site is underlain by Secondary-A Aquifers referring to the Glaciofluvial Deposits and the Coal Measures.

2.4.7 The Environment Agency define a Secondary-A Aquifer as:

2.4.8 *"Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers."*

2.4.9 The Environment Agency define a Secondary-B Aquifer as:

2.4.10 The site's proximity to groundwater Source Protection Zones (SPZs) was determined by reference to the EA's website. These zones show the risk of contamination from any activities that might cause pollution in the area, with the closer the activity, the greater the associated risk. The maps show three main zones (inner, outer and total catchment) to a groundwater source.

2.4.11 The site is not in a source protection zone.

2.5 Hydrology

2.5.1 The nearest surface water feature is the Sudden Brook located c. 40m to the south of the site. This is a small uncultivated section of the brook which is culverted under much of the surrounding area. The brook appears to flow to the west and then north into the River Roch.

2.5.2 A survey of the site shows that the culvert conveying the brook passes under the south east corner of the site (**Appendix B**).

2.5.3 The Rochdale Canal is located 180m to the south of the site at an elevation of c. 144m aOD.

4 FLOOD RISK ASSESSMENT

4.1 Overview

- 4.1.1 All potential sources of flood risk at the development site have been assessed based on the information listed in Section 1.3 and are summarised below. The key sources of flood risk to the proposed development are further described in the ensuing sections.

Table 4.1: Potential Sources of Flood Risk

Source	Flood Risk
Coastal	<i>No risk, site elevation approximately 120m aOD.</i>
Fluvial	FZ1, FZ2 and FZ3 present on site. Refer to Section 4.3.
Surface Water	Very low risk in general, but higher risk immediately to the west and south east. Refer to Section 4.4.
Groundwater	<i>EA indicate the site is outside a groundwater flood alert area.</i>
Sewers	Sewers on site. Refer to Section 4.5.
Infrastructure Failure	EA indicate flooding from reservoirs unlikely. Potential for flooding from Rochdale Canal. Refer to Section 4.6.

4.2 Climate Change

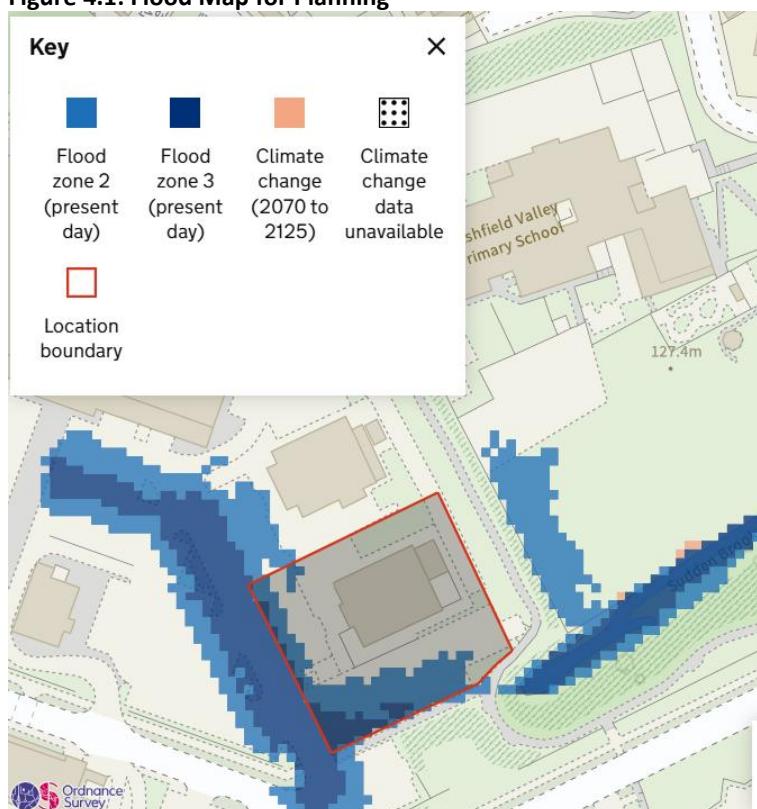
- 4.2.1 The NPPF sets out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change. This includes demonstrating how flood risk will be managed now and over the development's lifetime, taking climate change into account.
- 4.2.2 In accordance with the EA's climate change guidance, the proposed development must take account of the following allowances:
- Peak River Flows (Irwell Management Catchment, development lifespan into 2080s)
 - Central 35%
 - Higher Central..... 46%
 - Upper End 75%
 - Peak Rainfall Intensity (Irwell Management Catchment, 1& AEP, 2070s).
 - Central 30%
 - Upper End 45%

4.3 Fluvial Flood Risk

- 4.3.1 Fluvial flooding occurs when a catchment area receives greater than usual amounts of water (e.g. rainfall or snow melt). When the converging runoff exceeds the conveyance capacity of the receiving channel, water spills onto the surrounding floodplains and fluvial flooding occurs.
- 4.3.2 Fluvial flooding usually occurs hours or days after heavy and / or prolonged rainfall and its effects often last several hours or days.

- 4.3.3 Besides posing a direct flood risk to floodplain areas, high water levels in watercourses can exacerbate other sources of flood risk by surcharging / locking outfalls, thus preventing the normal discharge of flows or even back flowing into tributary drainage systems.
- 4.3.4 In accordance with the EA's *Flood Map for Planning* (Figure 4.1) most of the development site is in FZ1 (<0.1% AEP). However, areas associated with the Sudden Brook to the south east, and downgradient from the open section of the brook are in FZ23 and FZ3. These areas impinge on the south eastern edge of the site in the car park and road area.
- 4.3.5 The site does not benefit from formal flood defences.

Figure 4.1: Flood Map for Planning

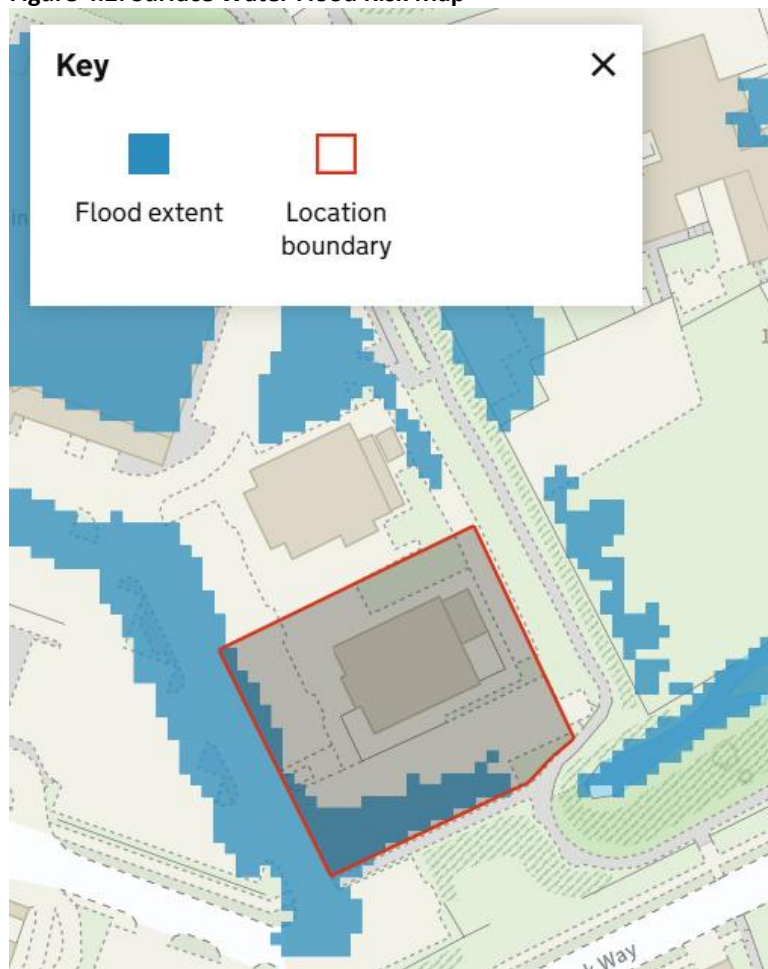


- 4.3.6 The EA's historic flood outlines show that the site has not flooded.
- 4.3.7 Detailed modelling data was requested from the EA but they have indicated they will not provide data for this area (**Appendix D**).
- 4.3.8 The predicted fluvial flooding inundates an area up to c. 129.25m aOD some 0.3m lower than the area immediately adjacent to the building, including when climate change is taken into consideration. The FZ3 area extends to a lower elevation.
- 4.3.9 In the absence of EA data, it is not possible to calculate the flood level associated with the 1 in 100 year plus 35% climate change. The 1 in 1000 year plus climate change flood extent will therefore be used as a pseudo 1 in 100 year + 35% CC flood extent; this is usually acceptable to the EA in such circumstances and is typically an overestimation of the design flood extent.
- 4.3.10 The management measures proposed to deal with any fluvial flooding are described in Section 1.

4.4 Surface Water Flood Risk

- 4.4.1 Surface water flooding is a description for excessive overland flows that have yet to enter a natural or manmade receptor (e.g. aquifer, watercourse or sewer). Surface water flooding also occurs when the amount of runoff exceeds the capacity of the collecting system and spills onto overland flow routes.
- 4.4.2 Surface water flooding is usually the result of intense, short lived rainfall events, but can also occur during milder, longer lived rainfall events, when collecting systems are at or near capacity or the ground is saturated. It often results in the inundation of low points in the terrain.
- 4.4.3 In accordance with the EA's *Flood Map for Planning* (Figure 4.2) the development site is generally not predicted to flood during a 1 in 100 year storm event. The southern corner of the site, which is part of the car park, is predicted to be inundated but the flooding is not predicted to extent to the building. This does not appear to be part of an overland flow. Note that the EA's *Long Term Risk of Flooding* portal does not predict any surface water flooding including into the 2040s.

Figure 4.2: Surface Water Flood Risk Map



- 4.4.4 The risk of surface water flooding from runoff generated within the development site will be managed by the drainage strategy described in Section 5.

4.5 Sewer Flood Risk

- 4.5.1 Sewer flooding occurs when a manmade drainage system receives greater than usual amounts of water and the overwhelmed system starts overflowing at gullies and manholes, thus generating overland flows.
- 4.5.2 Sewer flooding is usually the result of very intense, short lived rainfall events, but can also occur during milder, longer lived rainfall events, when outfalls become surcharged / locked by high water levels in the receiving feature.
- 4.5.3 In addition to a flood risk, overflowing combined sewers also pose a significant public health and environmental risk.
- 4.5.4 UU's asset location plans show public sewers along the eastern and southern site boundaries (**Appendix E**). In addition there will be private sewers serving the site.
- 4.5.5 Considering the nature of the site, any sewer flooding would be detrimental to business and so would be rectified quickly by either UU or the site management. The risk of sewer flooding is therefore considered to be low.

4.6 Infrastructure Failure Flood Risk

- 4.6.1 Infrastructure failure flooding occurs when a feature holding water above natural ground levels (e.g. reservoir or canal) is overtopped or breached. Infrastructure failure flooding is usually the result of extreme events in excess of the high standards of protection usually considered in the design of such structures (namely reservoirs).
- 4.6.2 The development site is located downstream of the Rochdale Canal, owned and maintained by the Canal and River Trust. The Canal is 180m south of the site with roads, buildings and open space between the site and the Canal.
- 4.6.3 Canal failures are rare in the UK, as the Canal and River Trust regularly inspects and repairs structures and constantly monitors water levels and manages excess water in a number of passive and active ways (e.g. weirs, sluices, locks, restricted navigation, etc.). The risk to the site is therefore considered to be low.

5 FLOOD RISK MANAGEMENT

5.1 Sequential and Exception Tests

- 5.1.1 The sequential, risk-based approach to the location of development is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. The aim is to keep development out of medium and high flood risk areas (Flood Zones 2 and 3) and other areas affected by other sources of flooding where possible.
- 5.1.2 Application of the sequential approach in the master planning process, in particular application of the *Sequential Test*, helps ensure that development can be safely and sustainably delivered, and developers do not waste resources promoting proposals which are inappropriate on flood risk grounds.
- 5.1.3 The *Sequential Test* ensures that a sequential approach is followed to steer new development to areas with the lowest probability of flooding. The aim is to steer new development to Flood Zone 1 (areas with a low probability of sea or river flooding). Where there are no reasonably available sites in Flood Zone 1, local planning authorities in their decision making should take into account the flood risk vulnerability of land uses and consider reasonably available sites in Flood Zone 2 (areas with a medium probability of sea or river flooding), applying the *Exception Test* if required. Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 (areas with a high probability of sea or river flooding) be considered, taking into account the flood risk vulnerability of land uses and applying the *Exception Test* if required.
- 5.1.4 [Table 2](#) of the *Flood Risk and Coastal Change Guidance* categorises different types of uses and development according to their vulnerability to flood risk. [Table 3](#) of the *Flood Risk and Coastal Change Guidance* () maps these vulnerability classes against flood zones to indicate where development is appropriate and where it should not be permitted.

Table 5.1: Flood Risk Vulnerability and Flood Zone Compatibility

Flood Zone	Flood Risk Vulnerability				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test	✓	✓	✓
Zone 3a	Exception Test	✗	Exception Test	✓	✓
Zone 3b	Exception Test	✗	✗	✗	✓

Key:

✓ Development is appropriate

✗ Development should not be permitted

- 5.1.5 The site is mostly in FZ1 with the areas located in FZ2 and FZ3 used for parking or roads. This follows a sequential approach to steer development away from flood risk. The Exception Test is not required for less vulnerable development in FZ1, FZ2 or FZ3a.

5.2 Fluvial and Surface Water Flood Risk

- 5.2.1 The building on site is not predicted to flood with fluvial or surface water up to the design storm event and the threshold of the building is estimated as 300mm above this level. Further mitigation is therefore not considered necessary however it would be prudent to consider the following:
- The development site is in an area covered by the EA's flood warning system, which should allow users enough time to deploy flood defences and / or evacuate the site before accesses become impassable. Site users should subscribe to the EA system ([Sign up for flood warnings - GOV.UK \(www.gov.uk\)](https://www.gov.uk/sign-up-for-flood-warnings)).
- 5.2.2 External ground levels should be designed to safely route overland flows away from buildings and towards the existing destination in the road to the south west of the site, using less vulnerable parts of the proposed development such as public open spaces, parking areas and roads.
- 5.2.3 The proposed surface water drainage strategy (Section 6) has been designed so that flooding does not occur on any part of the site for all events up to 1.0% AEP (1 in 100 years) + 45% climate change allowance.

6 SURFACE WATER DRAINAGE STRATEGY

6.1 Existing Drainage

6.1.1 Runoff generated within the existing commercial (brownfield) development is intercepted by road gullies in the hardstanding areas and conveyed towards the culverted Sudden Brook to the south of the site (**Appendix E**).

6.1.2 Greenfield runoff rates of 1.6l/s and 0.35 l/s/ha (100.0% AEP), 1.9l/s and 0.42 l/s/ha (Q_{BAR}), 3.2l/s and 0.70 l/s/ha (3.3% AEP) and 3.9l/s and 0.86 l/s/ha (1.0% AEP) have been established for the development site using the *FEH* methodology.

Table 6.1 Greenfield Run-off Rates

	Rate per ha (l/s/ha)	Site rate (l/s) – 0.22ha
Q1	1.6	0.35
Qbar	1.9	0.42
Q30	3.2	0.70
Q100	3.9	0.86

6.2 Hierarchy for Surface Water Disposal

6.2.1 The National Standards for Sustainable Drainage Systems (Defra, 2011) state that the following options must be considered in accordance with the hierarchy for surface water disposal:

6.2.2 Discharge to Ground (Infiltration)

6.2.3 Based on the available geological information (Section 2 of this report), infiltration drainage is deemed unfeasible at the development site. This is due to the presence of made ground, the existing buildings and the numerous services. Therefore, an alternative solution is proposed.

6.2.4 Discharge to Surface Water Body

6.2.5 As detailed in Section 2, there are surface water bodies to the south east of the site. This is a culverted watercourse into which the existing site surface water drainage discharges. Discharge into the culvert is therefore proposed.

6.2.6 Discharge to Sewer

6.2.7 Given surface water will discharge to a watercourse, discharge to sewer is not considered further.

6.3 Proposed Drainage Strategy

6.3.1 The proposed surface water drainage strategy has been designed in accordance with the *Building Regs Part H* and in compliance with the *NPPF*, local requirements and current best practices, to collect, convey and attenuate runoff from additional impermeable areas (0.045 ha) before discharge into the existing on-site surface water system and then the Sudden Brook.

- 6.3.2 The proposed drainage strategy intends to collect runoff via a series of gulleys before discharging into a below ground drainage network and use the same outfall as existing (**Appendix F**).
- 6.3.3 As the volume of runoff leaving the proposed development cannot be reduced to existing values through infiltration, the proposed drainage strategy has been designed to limit off-site discharges to 1 l/s. This is slightly higher than the greenfield run-off rates but is a practical minimum rate; the orifice / vortex for lower rates would be very small and at risk of blockage which would increase flood risk on the site.
- 6.3.4 The proposed drainage strategy has been designed so that:
- Flooding does not occur on any part of the site for all events up to 1.0% AEP (1 in 100 years) + 45% climate change allowance;
- 6.3.5 The performance of the proposed surface water drainage strategy has been tested for storm events with 100.0% AEP, 3.3% AEP and 1.0% AEP + 45% climate change and durations of 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960 and 1440 minutes.
- 6.3.6 The results of the simulations are included in **Appendix G** and demonstrate how the proposed surface water drainage strategy can manage surface water flood risk at the development site without increasing flood risk elsewhere for storm events up to the 1.0% AEP + 45% climate change allowance.
- 6.4 Sustainable Drainage Systems (SuDS)**
- 6.4.1 In accordance with the *NPPF*, (major) developments should incorporate sustainable drainage systems (SuDS) unless there is clear evidence that this would be inappropriate. In addition to water quantity control, SuDS should consider opportunities to provide water quality and amenity / biodiversity benefits (i.e. multifunctionality approach).
- 6.4.2 The proposed drainage strategy is reliant on an attenuation tank to manage runoff quantity. The table below shortlists other SuDS which have been considered and the reason they have not been used.
- 6.4.3 It is important to note the need to remove silt from runoff prior to discharge into SuDS features. SuDS such as filter drains, swales, bioretention systems and pervious pavements are sustainable alternatives to proprietary treatment systems otherwise required to manage silt.

Table 6.2: Sustainable Drainage Systems (SuDS)

SuDS Component	Description and Opportunities
Green / Blue Roofs	Green roofs are areas of living vegetation installed on the top of buildings for a range of reasons including visual benefit, ecological value, enhanced building performance and reduction of surface water runoff. A blue roof is a roof designed explicitly to store water for use within the building (rainwater harvesting) or controlled discharge. Green roofs that include reservoir storage zones beneath the growing medium could also be considered blue roofs. Green roofs can improve the thermal performance of buildings, help combat the urban heat island effect and contribute to improved air quality. Through evapotranspiration, green roofs can reduce peak flow rates to a site drainage system (principally for small and medium-sized events) but are unlikely to have a significant impact on downstream attenuation storage requirements. Blue roofs can be designed to provide significant attenuation (and evapotranspiration). Existing building which does not incorporate a green roof.
Filter Drains/Strips	Filter drains are trenches filled with stone/gravel that create temporary subsurface storage for the filtration, attenuation and conveyance of surface water runoff. Ideally, filter drains receive lateral inflow from adjacent impermeable surfaces pre-treated over a filter strip. Filter drains can help manage peak flows by naturally limiting rates of conveyance through the filter medium and by providing attenuation storage when the rate of flow at the outlet is controlled. Filter drains can be effectively incorporated into the landscape and public open spaces and can have minimal land-take requirements. The use of filter drains is typically restricted to flat sites (unless placed parallel to contours). Filter drains are best located adjacent to (small) impermeable surfaces such as car parks and roads / highways. There is very little scope to include such features given the existing site constraints.
Bioretention Systems Tree Pits	Bioretention systems (including rain gardens) are shallow landscaped depressions that can reduce runoff rates and volumes and treat pollution. They also provide attractive landscape features and biodiversity. Bioretention systems can help reduce flow rates from a site by promoting infiltration / evapotranspiration and providing some attenuation storage. Bioretention systems can also provide very effective treatment functionality. Bioretention systems are a very flexible surface water management component that can be integrated into a wide variety of developments / densities using different shapes, materials, planting and dimensions. Landscaped areas not included in the proposed design.
Rainwater Harvesting Tanks.	The collection, filtration and storage of rainwater from the roof. The water can then be re-used for toilets, washing machines and general garden use. Below ground tanks assists in keeping the water cool, eliminating bacterial growth, and keeping a high quality of water. Existing building and existing constraints do not provide opportunity for such structures.

SuDS Component	Description and Opportunities
Pervious Pavements	Pervious pavements provide a pavement suitable for pedestrian and / or vehicular traffic, while allowing rainwater to infiltrate through the surface and into the underlying structural layers. The water is temporarily stored beneath the overlying surface before use, infiltration to the ground or controlled discharge downstream. Pervious pavements help reduce flow rates from a site by providing attenuation storage. A flow control structure is required to constrain the rate of water discharged from the sub-base via an outlet pipe. Pervious pavement drainage has been shown to have decreased concentrations of a range of surface water pollutants, including heavy metals, oil and grease, sediment and some nutrients. Pervious pavements are typically built as an alternative to impermeable surfaces and therefore require no extra development space for their construction. Existing drainage and services will prevent installation of permeable paving.
Attenuation Storage Tanks	Attenuation storage tanks are used to create a below-ground void space for the temporary storage of surface water before use, infiltration or controlled release. Attenuation storage tanks can help reduce flow rates from a site by providing significant attenuation storage. Storage tanks do not provide any form of treatment of surface water runoff and therefore need to be combined in a “management train” with other methods that do provide suitable treatment of all relevant pollutants (coarse sediment must always be removed upstream of a storage tank). The inherent flexibility in size and shape of the typical attenuation storage tank systems means that they can be tailored to suit the specific characteristics and requirements of any site. However, the lack of amenity and biodiversity benefits means that storage tanks should be a last resource in any surface water drainage strategy for a major development. An attenuation tank is proposed in the south east of the site.

6.5 Exceedance Events

- 6.5.1 In the event of a storm event greater than the 1.0% AEP + 45% climate change, or a failure of the drainage system, exceedance flows may be generated from the drainage network. Flows will continue towards the existing destination in the road to the south west of the site, using less vulnerable parts of the proposed development such as public open spaces, parking areas and roads.

6.6 Water Quality Management

- 6.6.1 The suitability of the proposed drainage strategy to manage the development’s pollution risk has been assessed using the simple index approach in *The SuDS Manual* (2015), as summarized in the table below.

Table 6.3: Surface Water Quality Management (Simple Index Approach)

Runoff Route / Treatment Train				
Land Use / SuDS	Hazard Level	TSS	Metals	Hydrocarbons
Pollution Hazard Indices				
Driveways, residential car parks and low traffic roads	Low	0.50	0.40	0.40
SuDS Mitigation Indices				
Vortex separator	-	0.50	0.40	0.80
Total SuDS Mitigation Index $\geq$ Pollution Hazard Index (for each contaminant type)				

6.7 Operation and Maintenance

- 6.7.1 The function of the surface water drainage system must be understood by those responsible for maintenance, regardless of whether individual components are below ground or on the surface. In any system properly designed, monitored and maintained, performance deterioration can usually be minimised.
- 6.7.2 The long-term operation and maintenance of the proposed surface water drainage strategy will be the responsibility of entities, as detailed in the table below. Appropriate legal agreements defining maintenance responsibilities and access rights over the lifetime of the proposed development must be established prior to construction.

Table 6.4: Entities Responsible for SuDS Maintenance

SuDS Component	Location	Function	Responsible Entity
Vortex separator	Immediately upstream of the attenuation tank	Improve water quality	Private management company
Attenuation Storage Tank	Parking – drive through lane	Store runoff	Private management company

- 6.7.3 Where the user / benefiter of a system is not responsible for maintenance, then it is important to ensure that they know when the SuDS is not functioning correctly and who to contact if any issue arises.
- 6.7.4 Maintenance plans are often required to clearly identify who is responsible for maintaining proposed SuDS as well as the maintenance regime to be applied. Maintenance plans can also form a useful tool for public engagement with SuDS and understanding their wider benefits. The maintenance requirements of the proposed surface water drainage strategy are summarised in the table below.

Table 6.5: Typical Operation and Maintenance Requirements

Operation and Maintenance Activity	SuDS Component	
	Vortex Separator	Attenuation Storage Tank
Regular Maintenance		
Inspection	■	■

Operation and Maintenance Activity	SuDS Component	
	Vortex Separator	Attenuation Storage Tank
Litter and debris removal	■	□
Occasional Maintenance		
Sediment management	■	■
Remedial Maintenance		
Structure rehabilitation/repair	□	□
Key: ■ Will be required □ May be required		

6.8 Drainage During Construction

- 6.8.1 Drainage is typically an early activity in the construction of a development, taking form during the earthworks phase as it is the responsibility of the contractor to manage all construction runoff rates and water quality. However, the connection of piped drainage system to SuDS components should not take place until the end of construction works, unless a robust strategy for silt removal prior to occupation of the site is implemented.
- 6.8.2 Silt-laden runoff from construction sites represents a common form of waterborne pollution and cannot enter SuDS components not specifically designed to manage this, as it can overwhelm the system and pollute receiving water features. Any gullies and piped systems should be capped off during construction and fully jetted and cleaned prior to connection to SuDS components.
- 6.8.3 The three principal aspects of drainage during construction are conveying runoff, controlling runoff and trapping sediments:
- Conveyance of runoff can be achieved through small ditches / swales, channels and drains. Runoff control measures should be implemented to ensure that runoff does not overwhelm the temporary drainage system causing flooding on site or elsewhere.
 - Control of runoff can be achieved through perimeter ditches or appropriate grading to ensure that any runoff from the construction site stays on site. Runoff rates leaving the site should be managed so they do not exceed the proposed rates stated in this report, based on pre-development conditions.
 - Construction runoff should be directed to dedicated settlement basins with adequate upstream sediment and pollution control such as sediment basins, silt fences and straw bales prior to infiltration or off-site discharge.
- 6.8.4 Additional conveyance, control and treatment measures should be installed as needed during grading. Slope stability needs to be considered when using open water features to convey, control and treat runoff across the site. Any necessary surface stabilisation measures should be applied immediately on all disturbed areas where construction work is either delayed or incomplete.
- 6.8.5 Maintenance inspections should be performed weekly, and maintenance repairs should be made immediately after periods of rainfall.

- 6.8.6 All drainage infrastructure (namely underground features) must be protected from damage by construction traffic and heavy machinery through the implementation of measures such as protective barriers and storing construction materials away from the drainage infrastructure.

7 CONCLUSIONS AND RECOMMENDATIONS

- 7.1.1 JNP Group has been commissioned by Stantec UK Limited to prepare a flood risk assessment and drainage strategy for the proposed reconfiguration of an existing retail unit to facilitate a dual lane drive-through.
- 7.1.2 The site is brownfield and is approximately 0.22ha. The proposed development alters the external layout to allow a dual lane drive through. The new drive through lane has an area of 0.045ha.
- 7.1.3 Made ground is indicated to be present underlying the site. The geology of the site to be is indicated to be Glaciofluvial Deposits, underlain by mudstone, siltstones and sandstones of the Pennine Lower Coal Measures, both of which are classified as Secondary-A Aquifers.
- 7.1.4 The nearest surface water feature is the Sudden Brook which is culverted beneath the south east corner of the site.
- 7.1.5 The Flood Risk Assessment section of this report demonstrates that the risk of flooding from all most (tidal, groundwater, sewer and reservoir) is low. The south western corner of the site is predicted to be impacted by fluvial and surface water flooding. The building on site is not predicted to flood with fluvial or surface water up to the design storm event and the threshold of the building is estimated as 300mm above this level. Further mitigation is therefore not considered necessary however it would be prudent to consider the following:
- Site users should subscribe to the EA system ([Sign up for flood warnings - GOV.UK \(www.gov.uk\)](https://www.gov.uk/sign-up-for-flood-warnings)).
 - External ground levels should be designed to safely route overland flows away from buildings and towards the existing destination in the road to the south west of the site, using less vulnerable parts of the proposed development such as public open spaces, parking areas and roads.
 - The proposed surface water drainage strategy (Section 6) has been designed so that flooding does not occur on any part of the site for all events up to 1.0% AEP (1 in 100 years) + 45% climate change allowance.
- 7.1.6 Runoff generated within the existing commercial (brownfield) development is intercepted by road gullies in the hardstanding areas and conveyed towards the culverted Sudden Brook in the south east of the site.
- 7.1.7 The proposed drainage strategy intends to collect, convey and attenuate runoff from additional impermeable areas before discharge into the existing on-site surface water system and then the Sudden Brook.
- 7.1.8 The discharge rate is to be restricted to 1 l/s using a Hydrobrake flow control, a practical minimum rate.
- 7.1.9 The proposed drainage strategy incorporates the following SuDS features:
- Attenuation tank
- 7.1.10 The proposed surface water drainage strategy can manage surface water flood risk at the development site without increasing flood risk elsewhere for storm events up to the 1.0% AEP plus 45% climate change allowance.

- 7.1.11 Overland flows resulting from exceedance events are expected to leave the developed site to the south west, as currently occurs.
- 7.1.12 Water quality management is to be achieved through the treatment potential of a vortex separator. The hazard level is very low, and the water quality treatment is considered acceptable following the completion of the simple index approach from the SuDS Manual.
- 7.1.13 An operation and maintenance plan has been provided as part of this report in accordance with the SuDS Manual, which includes a review of all drainage elements, including SuDS features.
- 7.1.14 This report is intended for the use of the developer of the site in support of their planning application for the site only.

8 LIMITATIONS

- 8.1.1 The information, conclusions and recommendations presented within this report are deemed to be current at the time of issue. No guarantee can be given to the status of this information other than at the time of issuing. Where necessary, the user shall confirm the status of any applicable assessments and consents.
- 8.1.2 This report has been commissioned by Stantec UK Limited. No third party may receive a copy of this report without first obtaining our permission in writing.
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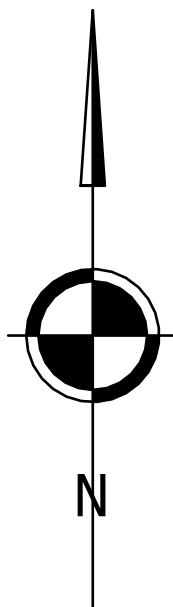
APPENDIX A: TOPOGRAPHICAL SURVEY



STANDARD REFERENCE & ABBREVIATIONS

- (AR).....Assumed Route
- AB.....Asp Brick
- AV.....Air Valve
- B/W.....Barbed Wire
- BAH.....Barrier
- BB.....Bellisha Beacon
- BM.....Borehole
- BL.....Bed Level
- BOL.....Bollard
- BS.....Bus Stop
- BT Box.....British Telecom Box
- BRTW.....Brick Retaining Wall
- BR.....Brick Wall
- C/B.....Close Boarded
- C/I.....Corrugated Iron
- C/P.....Chestnut Paving
- CB.....Control Box
- CBM.....Concrete Block Wall
- CCTV.....Closed Circuit TV
- CD.....Cable Duct
- CEL.....Cellar Light
- CH/L.....Chain Link
- CH.....Chimney
- CL.....Cover Level
- CM.....Cable Marker
- CMC.....Golem
- CMC.....Concrete
- CP.....Catch Pit
- CRW.....Concrete Retaining Wall
- CTV.....Cable Television
- CUL.....Culvert
- CK.....Concrete Block Wall
- DC.....Drainage Channel
- DPC.....Damp Proof Course
- DR.....Drain
- DSM.....Dry Stone Wall
- ECP.....Electricity Cable Pit
- EIC.....Electricity Inspection Cover
- EJ.....Expansion Joint
- EJ.....Electricity Junction Box
- EL BUS STN.....Electricity Sub Station
- EL.....Eaves Level
- ELB.....Electricity Box
- EP.....Electricity Pole
- ER.....Earth Road
- ET.....Electricity Transmission Line
- FB.....Flower Bed
- FR.....Fire Hydrant
- FL.....Floor Level
- FP.....Flagpole
- G*.....Girth (of tree)
- G.....Gully
- GMB.....Garden
- GIP.....Gas Inlet Pipe
- GMB.....Gas Marker
- GST.....Gas Stop Tap (Domestic)
- GSV.....Gas Stop Valve (Mains)
- HSE.....Housing
- HT.....Height
- HV.....High Voltage
- I/R.....Iron Railing
- IC.....Inspection Cover
- IL.....Invert Level
- IP.....Inlet Pipe
- KO.....Kerb Outlet
- LB.....Letter Box
- LP.....Lamp Post
- MD.....Multi-dirth
- MH.....Manhole
- MOR.....Marker
- MP.....Moorling Point
- MP.....Street Name Plate
- OH.....Overhead
- O/P.....Open Paving
- OE.....Overhead Electric Wire
- OP.....Outfall Pipe
- OSBM.....Ordnance Survey Bench Mark
- OT.....Overhead Telecom Wire
- P/C.....Post & Chain
- P/H.....Post & Hall
- P/W.....Post & Wire
- PAV.....Paving
- PB.....Pillar Box
- PC.....Pedestrian Crossing
- PP.....Petrol Pump
- PT.....Post or Pillar
- RE.....Rodding Eye
- RS.....Road Sign
- R/W.....Retaining Wall
- RWP.....Retic Water Pipe
- SAP.....Sapping
- SL.....Sump Level
- SL.....Soffit Level
- SP.....Sign Post
- SPL.....Springing Level
- SRW.....Stone Retaining Wall
- SV.....Stop Valve (unspecified)
- SVP.....Soil Vent Pipe
- SW.....Stone Wall
- TAC.....Tactile Paving
- TB.....Traffic Bollard
- TBM.....Temporary Bench Mark
- TGB.....Telephone Call Box
- TRN.....Taken from Records
- TIE.....Tie (Masts/Poles)
- TL.....Traffic Light
- TLB.....Traffic Light Control Box
- TM.....Turret Machine
- TMC.....Tarmac
- TP.....Telecommunications Pole
- TPIT.....Trial Pit
- TS.....Trash Screen
- U/C.....Under Construction
- UG.....Underground
- UTL.....Unable to Lift (BM, IC etc)
- UTS.....Unable to Survey
- VDP.....Vehicle Detector Pad
- VP.....Vent Pipe
- W/W.....Wire Mesh
- WL.....Water Level
- WM.....Water Meter
- WO.....Wash Out
- WP.....Waste Pipe
- WST.....Water Stop Tap (domestic)
- WSP.....Water Stop Valve (mains)

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Note:
The survey is plotted on a plane local
Grid. Orientation to National Grid.
All levels relate to Ordnance Datum,
achieved using the
OS National GPS Network.
Survey Control Markers established for
Mapping purposes only and should not be
used for Construction without the written
approval of Survey Operations Ltd.
Drainage information must be verified
with local authority records before use

SURVEY STATIONS			
Name	Easting	Northing	Height
SO1	389286.21	411739.39	129.59
SO2	389285.50	411774.73	129.46
SO3	389306.23	411793.01	129.18
SO4	389314.29	411755.13	129.03



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Tel: 01695 725662 Fax: 01695 51816
Email: mail@survops.co.uk - www.survops.co.uk

Client
The Ratcliffe Groves Partnership

Drawing Title
Topographical Survey of Land at:
Former Pink Drips
Sandbrook Park
Rochdale

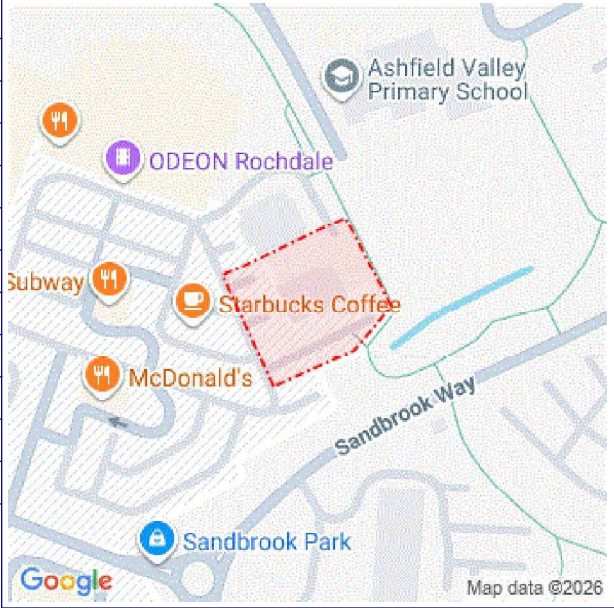
Scale(s)	1:200	Surveyor	DC
Date	JAN 25	Drawn	JR
Job Number	24C149	Checked	TP

Sheet Size & Drg Number & Revision
A1 24C149/001

APPENDIX B: CULVERT LOCATION

June: 2026



Enquiry Details		Site Map
Enquiry type	Planned Works	
Work category	Utility Works	
Work type	Multiple excavations site (1.5m or shallower)	
Work type buffer*	25 metres	
Start date	06/06/2026	
End date	03/07/2026	
Scheme/Reference	Pink Dripps Desserts, Rochdale	
Search location	XY= 389278, 411769	
Confirmed location	389286 411775	
Site size	2861 metres square	
Site Contact Name	PETER SMITH	
Site Phone No.	07427401344	
Description of Works	SURVEY	Please note that the above map only displays the location of the proposed work site and will not display any of the Members' pipes and cables. It is imperative that this area accurately reflects the proposed work site.
* The WORK TYPE BUFFER is a distance added to your search area based on the Work type you have chosen.		

Affected LSBUD members

(LSBUD Members who have assets registered on LSBUD within the vicinity of your search area.)

Do not proceed until all Members listed below have confirmed that your works can continue.

Asset Owner	Asset Type	Phone/Email	Emergency Only	Status
Cadent Gas	Gas	0800688588	0800111999	Await response
Electricity North West Limited	Electricity	08001954141	08001954141	Await response

Status explanation

Await Response means that the asset owner will contact you. This is typically by sending the plan response but they may ask for further information before being able to do so, particularly if any payments or authorisations are required.

Email Additional Info means that the asset owner needs further information about your works to assess your enquiry before providing a response. Please provide any details you have available including plans, method statements etc. if available.

Important notices

It is very important that you correctly understand what the service does and the procedures in order for you to work safely. Please refer to the LSBUD Support Page (www.lsbud.co.uk/linesearchbeforeudig-support) for further guidance.

This information includes how to provide additional information to the LSBUD Members who request it to provide a response to your enquiry.

Validity and search criteria. The results of this enquiry are based on the confirmed information you entered and are valid only as at the date and time of the enquiry. It is your responsibility to ensure that the Enquiry Details are correct, and LinesearchbeforeUdig (LSBUD) accepts no responsibility for any errors or omissions in the Enquiry Details or any consequences thereof. LSBUD Members update their asset information on a regular basis so you are advised to consider this when undertaking any works. It is your responsibility to choose the period of time after which you need to resubmit any enquiry but the maximum time (after which your enquiry will no longer be dealt with by the LSBUD Helpdesk and LSBUD Members) is 28 days. If any details of the enquiry change, particularly including, but not limited to, the location of the work, then a further enquiry must be made.

Terms and Conditions. Please note that this enquiry is subject always to our standard terms and conditions available at www.lsbud.co.uk ("Terms of Use") and the disclaimer at the end of this document. Please note that in the event of any conflict or ambiguity between the terms of this Enquiry Confirmation and the Terms of Use, the Terms of Use shall take precedence.

List of not affected LSBUD members

(LSBUD Members who do not have assets registered on the LSBUD service within the vicinity of your search area.)

Statera Energy Operations Ltd – Wakefield Control Room	Advanced Electricity Networks	Air Products PLC
AllPoints Fibre	Angus Energy	AWE Pipeline
B & D Energy Limited	Bakkafrost Scotland Limited	Balfour Beatty Investments Limited
BOC Limited (A Member of the Linde Group)	Box Broadband	BP Exploration Operating Company Limited
BPA	Burwell 11 Solar Limited	Cambridge Water
Cambridgeshire County Council Climate Change and Energy Services	CATS Pipeline c/o Wood Group PSN	Cemex
Centrica Storage Ltd	CNG Services Ltd	Concept Solutions People Ltd
ConocoPhillips (UK) Teesside Operator Ltd	D.S.Smith	Diamond Transmission Corporation
DIO (MOD Live Pipelines)	Drax Power Limited	E.ON UK Network Assets Limited
Eden Estuary Energy Limited	EDF Energy Renewables Ltd	EET Fuels
EirGrid	Eleclink Limited	Energy Assets Networks
ENI & Himor c/o Penspen Ltd	EnQuest Heather Ltd	EP Langage Limited
ESB CCGT Power station (Carrington Gas Pipeline)	ESP Utilities Group	Esso Petroleum Company Limited
euNetworks Fiber UK Ltd	EXA Infrastructure	Exolum Pipeline System
Fulcrum Electricity Assets Limited	Fulcrum Pipelines Limited	G.Network Communication Ltd c/o JSM Group Ltd
Gamma	Gas Networks Ireland (UK)	Gateshead Energy Company
Gigaclear Ltd	Greenlink Interconnector Ltd	Harbour Energy
Heathrow Airport LTD	Humbly Grove Energy	IGas Energy
Impala Terminals Infrastructure Ltd	Indigo Networks	INEOS FPS Pipelines
INEOS Manufacturing (Scotland and TSEP)	INOVYN ChlorVinyls Limited	INOVYN Enterprises Limited
Intergen (Coryton Energy or Spalding Energy)	Kensa Utilities	Last Mile
Liverpool City Region Connect	Mainline Pipelines Limited	Manchester Jetline Limited
Manx Cable Company	Marchwood Power Ltd (Gas Pipeline)	Melbourn Solar Limited
Mining Remediation Authority	MUA Group Limited	Mutual Energy
National Gas Transmission	National Grid Electricity Distribution	National Grid Electricity Transmission
National Grid Ventures	Neos Networks	Northern Gas Networks Limited
Northumbrian Water Group	NTT Global Data Centers EMEA UK Ltd	NYnet Ltd
Ogi	Oikos Storage Limited	Ørsted
Palm Paper Ltd	Perenco UK Limited (Purbeck Southampton Pipeline)	Petroineos
Phillips 66	Portsmouth Water	Redundant Pipelines - LPDA
RWE Generation (NGT)	SABIC UK Petrochemicals	SAS Utility Services Ltd

Scottish and Southern Electricity Networks	Scottish Power Generation	Seabank Power Ltd
SES Water	SGN	Shell
Shell NOP	South Staffs Water	SP Energy Networks
Spring Fibre Limited	SSE Generation Ltd	SSE Private Networks / iDNO
SSE Transmission	Storengy	Sutton Bridge Power Generation
Tata Communications (c/o JSM Construction Ltd)	TfL – London Underground HV Cables (Road & Track Side Cables)	toob Limited
Total (Colnbrook) c/o Penspen	Total Finaline Pipelines	Trafigura PTE Ltd
Transmission Capital	Trojan Energy Limited	UK Power Distribution
UK Power Networks	Uniper UK Ltd	University of Cambridge Granta Backbone Network
Vattenfall	Veolia ES SELCHP Limited	Veolia ES Sheffield Ltd
Virgin Media O2	Voneus Limited	VPI Power Limited
Wales and West Utilities	Welsh Power	West of Duddon Sands Transmission Ltd
West Sussex OpenNetwork (Cooperative National Infrastructure)	Westminster City Council	Winnington CHP Ltd
Zayo Group UK Ltd c/o JSM Group Ltd		

Non-LSBUD members (Asset owners not registered on LSBUD)

(The following Non-LSBUD Members may have assets in your search area. It is YOUR RESPONSIBILITY to contact them before proceeding.

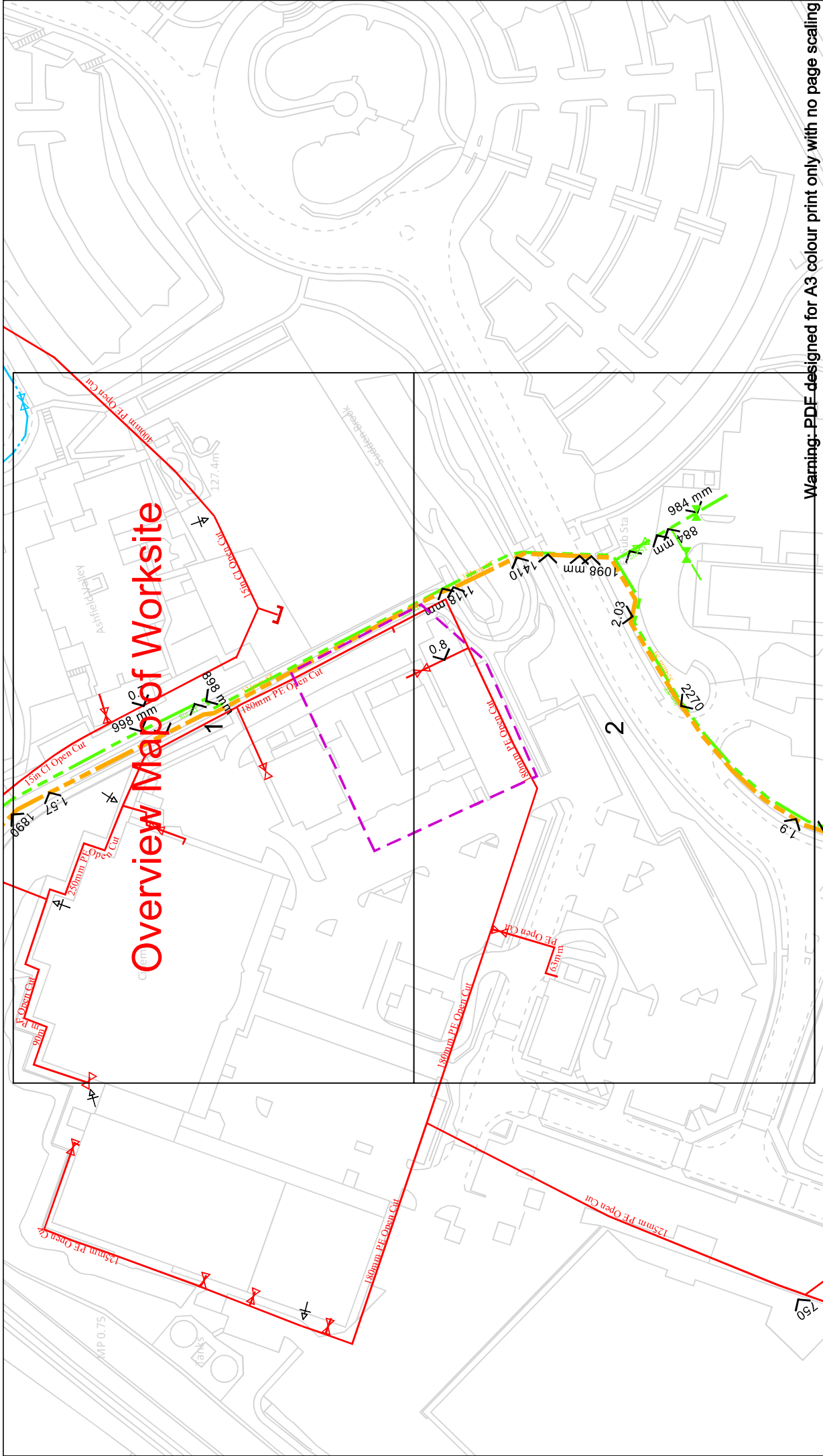
Please be aware this list is not exhaustive and it is your responsibility to identify and contact all asset owners within your search area.)

Asset Owner	Preferred contact method	Phone	Status
Bring Energy	nrsua@bringenergy.com	0800 130 3600	Not Notified
BT	https://www.swns.bt.com/pls/mbe/welcome.home	08000232023	Not Notified
CityFibre	asset.team@cityfibre.com	033 3150 7282	Not Notified
Colt	plantenquiries@catelecomuk.com	01227768427	Not Notified
GTC	https://pe.gtc-uk.co.uk/PlantEnqMembership	01359240363	Not Notified
Lumen Technologies	plantenquiries@ocugroup.com	02087314613	Not Notified
Mobile Broadband Network Limited	mbnl.plant.enquiries@turntown.com	01212 621 100	Not Notified
Network Rail	OPBuriedServicesEnquiries@networkrail.co.uk	01904523401	Not Notified
Sky UK Limited	nrsua@sky.uk	02070323234	Not Notified
Sota	sota.plantenquiries@ocugroup.com		Not Notified
United Utilities	WastewaterDeveloperServices@uuplc.co.uk	08707510101	Not Notified
Utility assets Ltd	assetrecords@utilityassets.co.uk		Not Notified
Verizon Business	osp-team@uk.verizonbusiness.com	01293611736	Not Notified
Virgin Media	http://www.digdat.co.uk	08708883116	Not Notified
Vodafone	osm.enquiries@atkinsglobal.com	01454662881	Not Notified

Disclaimer

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Warning: PDF designed for A3 colour print only with no page scaling

In case of an emergency call 0800 111 999

WARNING! This area contains Gas Mains Operating at High Pressure (in excess of 7 bar) and/or Intermediate Pressure (between 2 and 7 bar). Before excavating in this area, contact the Plant Protection team on 0800 688 588 or plantprotection@cadentgas.com

IMPORTANT NOTICES

This plan shows these pipes, owned by Cadent Gas Limited, in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GT's or otherwise privately owned may be present in this area. Information with regards to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any errors or omissions. Safe digging practices, in accordance with HSG47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

Where an out-of-standard service is present please contact plant protection 0800 688 588 for further information. Out-of-standard service symbology may be used to indicate one or more of the following:

- Identification of shallow services
- Recording of non-perpendicular services
- A perpendicular service/connection is laid in a straight line from the entry point at the property to the connection at the main – this includes a pipe that has a perpendicular connection and is not straight but does not deviate more than 1m off centre line.

Dig Sites

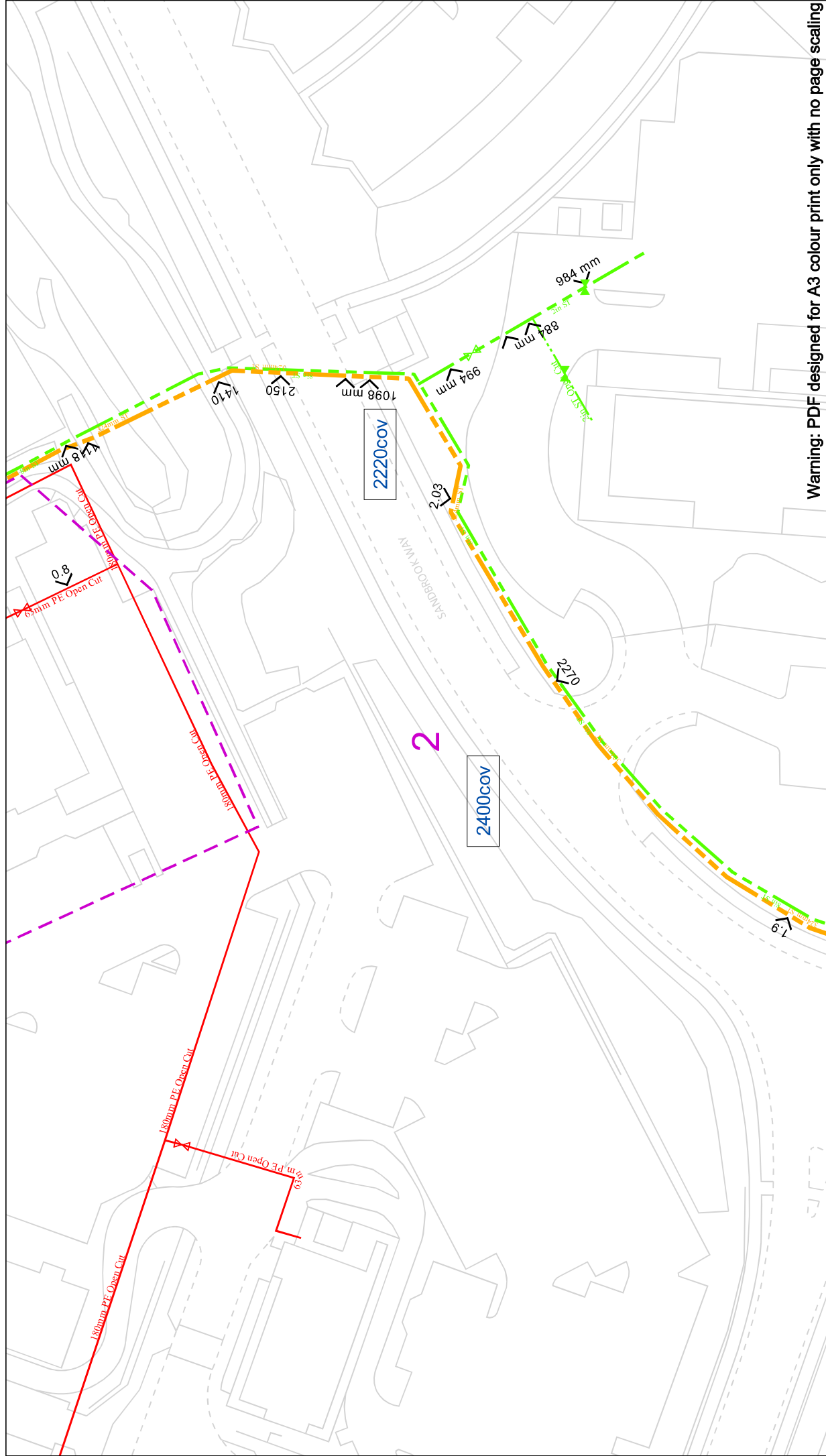
LP Mains	Area: ---	Line: ---	Diameter Change
MP Mains	Valve	Valve	
IP Mains	Depth of cover	Material Change	
LHP Mains	Syphon	Out of Standard Service	

Where an out-of-standard service is present please contact plant protection 0800 688 588 for further information. Out-of-standard service symbology may be used to indicate one or more of the following:

- Identification of shallow services
- Recording of non-perpendicular services
- A perpendicular service/connection is laid in a straight line from the entry point at the property to the connection at the main – this includes a pipe that has a perpendicular connection and is not straight but does not deviate more than 1m off centre line.

Date Requested: 05/06/2026
Job Reference: 41775880
Site Location: 389286 41775
Requested by:
Mr Paul Weaver
Your SchemeReference: Pink
Dripps Desserts, Rochdale

Scale: 1:1025 (When plotted at A3)



Warning: PDF designed for A3 colour print only with no page scaling

In case of an emergency call 0800 111 999

WARNING! This area contains Gas Mains Operating at High Pressure (in excess of 7 bar and/or Intermediate Pressure (between 2 and 7 bar). Before excavating in the area, contact the Plant Protection team on 0800 688 588 or plantprotection@cadentgas.com

IMPORTANT NOTICES

This plan shows these pipes, owned by Cadent Gas Limited, in its role as a Licensed Gas Transporter (ET). Gas pipes owned by other GT's or otherwise privately owned may be present in this area. Information with regards to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, sub connections etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any errors or omission. Safe digging practices, in accordance with HSG47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

Dig Sites

- LP Mains
- MP Mains
- IP Mains
- LHP Mains

- Valve
- Depth of cover
- Syphon
- Diameter Change
- Material Change
- Out of Standard Service

50m

Where an out-of-standard service is present please contact plant protection 0800 688 588 for further information.
Out-of-standard service symbology may be used to indicate one or more of the following:

- Identification of shallow services
- Recording of non-perpendicular services

A perpendicular service/connection is laid in a straight line from the entry point at the property to the connection at the main – this includes a pipe that has a perpendicular connection and is not straight but does not deviate more than 1m off centre line.



Scale: 1:500 (When plotted at A3)

Overview Map of Worksite

MP 0.75

Tanks

1

127.4m

SAHURACK WAY

El Sub Sta

ESS

2

Warning: PDF designed for A3 colour print only with no page scaling

In an emergency call 105,
24 hours a day

Date Requested: 05/06/2026
Job Reference: 41775880
Site Location: 389286 411775
Requested by:
Mr Paul Weaver
Your Scheme/Reference: Pink
Dripps Desserts, Rochdale

Scale: 1:1025 (When plotted at A3)

IMPORTANT INFO

Unless otherwise indicated the depth of Electricity North West Limited cables are in accordance with NUJG (450mm for Low Voltage & 600mm for 11kV cables) 33kV and 132kV cables are laid at depths as marked. The depth and positions of Electricity North West Limited equipment was accurate as shown when the equipment was installed. However third parties may have altered the level & other reference data. Therefore Electricity North West Limited accept no responsibility for the position of Electricity North West Limited equipment being different from shown. No person, body or company, shall be relieved from liability for damage caused to Electricity North West Limited equipment by reason of being located differently to the indications on this drawing or from any regulatory loss of income or incentive, or expense, which may be suffered by Electricity North West Limited and which is caused or contributed to by any loss of supply as a result of any damage caused to Electricity North West Limited's equipment. Service cables are not necessarily shown but must be assumed to exist to all premises, streetlights and signs. There may be other Electricity North West Limited apparatus in the vicinity which is not indicated on the cable records. Other apparatus may also be present which is owned by a third party other than Electricity North West Limited.

Reference should be made to HSE Guidance, H5(GJ47 "Avoiding Danger from Underground Services" and G56 "Avoiding Danger from Overhead Power Lines". Electricity North West Limited, Borron Street, Portwood, Stockport, Cheshire, SK1 2JD Registered in England and Wales. Registered No 02365949

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Electricity North West
Borron Street
Portwood, Stockport
Cheshire, SK1 2 JD
Phone: 0800 195 4141
Email: planrequest@enwl.co.uk

Operating Voltage

132kV

33kV

22kV-25kV

6kV-6.6kV

1kV-6kV

LV

Unknown Voltage

Colour Code

Black

Green

Yellow

Red

Blue

Violet

Orange

Brown

Line Colour

Black

Green

Yellow

Red

Blue

Violet

Orange

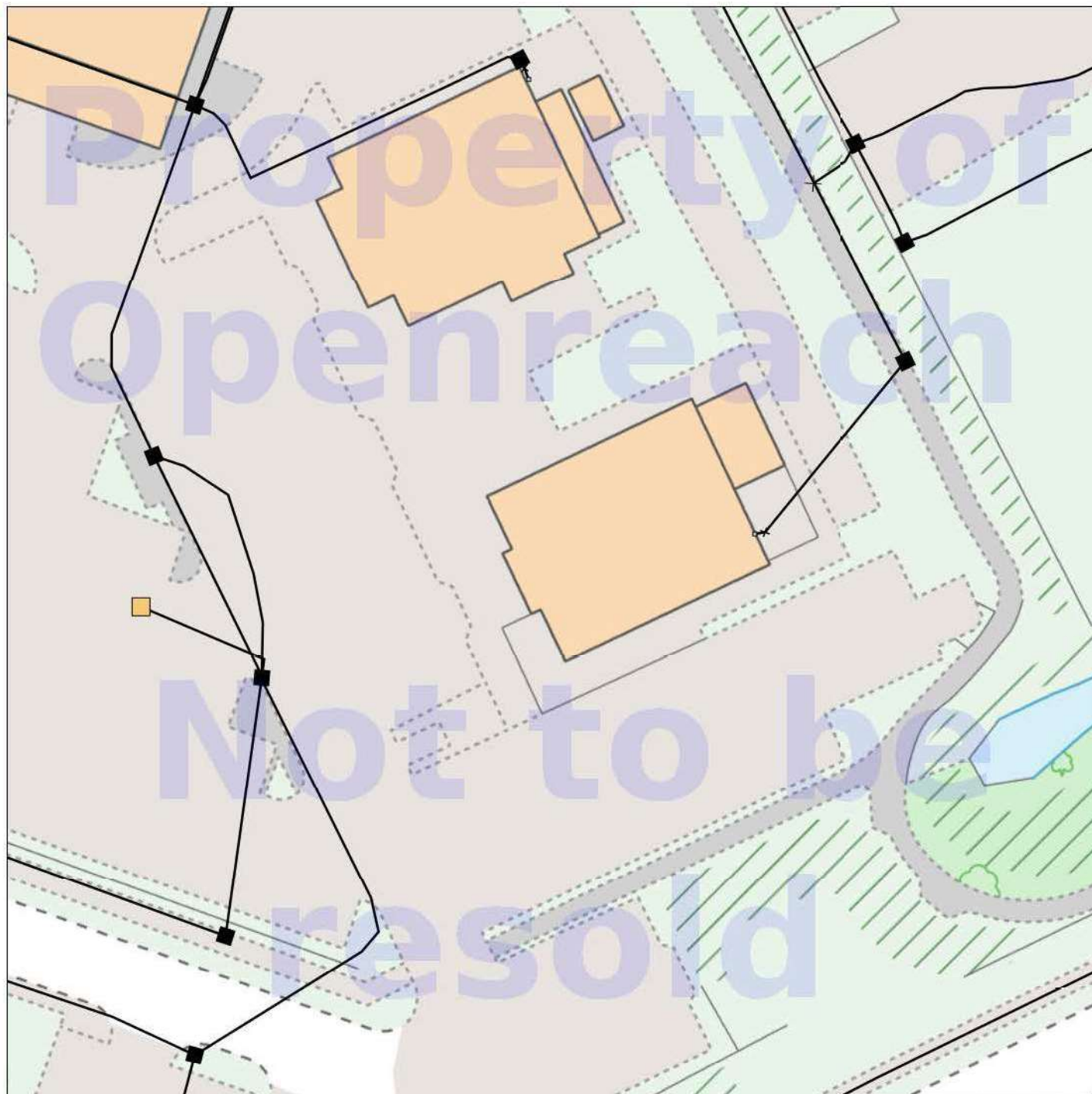
Brown

Dig Sites

Area:

Line:

Maps on Demand Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy. It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.

 **openreach**

CLICK BEFORE YOU DIG

FOR PROFESSIONAL FREE ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS INCLUDING LOCATE AND MARKING SERVICE

email cbyd@openreach.co.uk

ADVANCE NOTICE REQUIRED
(Office hours: Monday - Friday 08.00 to 17.00)
www.openreach.co.uk/cbyd

Accidents happen

If you do damage any Openreach equipment please let us know by calling 0800 023 2023 (opt 1 + opt 1) and we can get it fixed ASAP

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KEY TO BT SYMBOLS

	Planned	Live	Change Of State	+	Hatchings	
			Split Coupling	×	Built	
PCP			Duct Tee	▲	Planned	
Pole			Building	■	Inferred	
Box			Kiosk	Ⓚ	Duct	
Manhole			Other proposed plant is shown using dashed lines. BT Symbols not listed above may be disregarded. Existing BT Plant may not be recorded. Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.			
Cabinet						
	Pending Add	In Place	Pending Remove	Not In Use		
Power Cable						
Power Duct				N/A		

BT Ref : JME19234J

Map Reference : (centre) SD8927811769

Easting/Northing : (centre) 389278,411769

Scale : 1:100

Issued : 05/06/2026 19:23:34

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk

United Utilities Maps for SafeDig

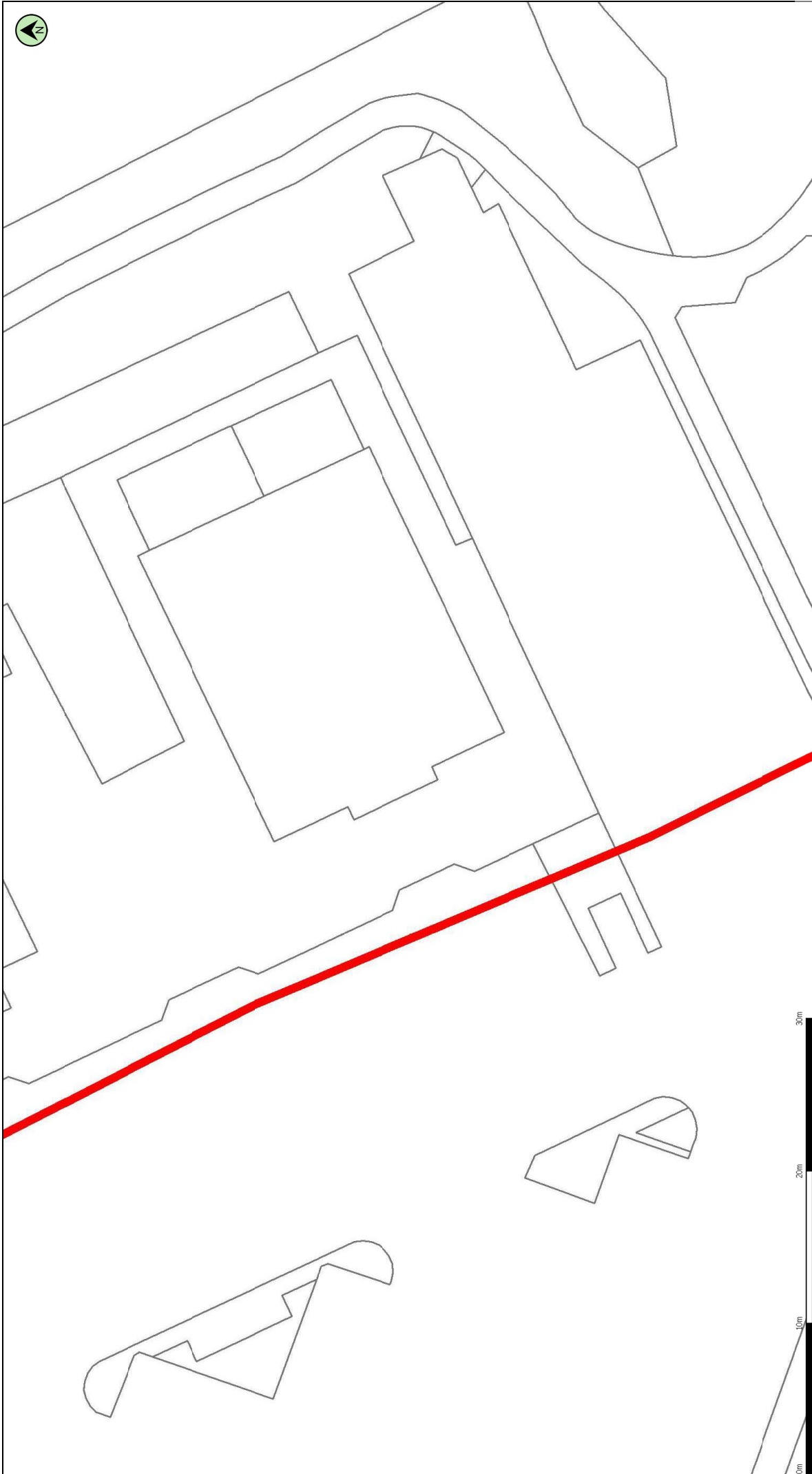
Date :	05/06/2026 19:24:26
Centre X:	389283
Centre Y:	411763
Scale :	250
UserName:	UTILM4U

Extract from maps of United Utilities' Underground Assets

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private service pipes may be shown by a blue broken line. United Utilities Water will not accept liability for any damage caused by the actual position being different from those shown.

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Duct, Trench

Chamber / Pole

Cabinet

This plan has been prepared to assist in identifying the location of Virgin Media apparatus. While we have taken care to ensure its accuracy, we cannot guarantee that it is complete or error-free. In addition, we caution that within Virgin Media apparatus there may be instances where mains voltage power cables have been placed inside green, rather than black ducting. This plan should not be relied upon as the sole source of information when carrying out excavation or other works. The actual position of any underground services must be confirmed on site using appropriate cable detection equipment, and other methods beyond any mechanical plant is used. Accordingly, unless it is due to the negligence of our agents, Virgin Media Limited shall not be liable for any damage or loss caused by the use of this plan. Should you find, whilst carrying out the works, that apparatus belonging to Virgin Media Limited, is not marked, or is incorrectly marked, can you please take such steps as are reasonably practicable to inform Virgin Media Limited of its location and (so far as appears from external inspection) its nature and whether it is in use. This plan is produced by Virgin Media Limited. © Crown copyright and database rights 2026 OS AC0000818557



Disclaimer

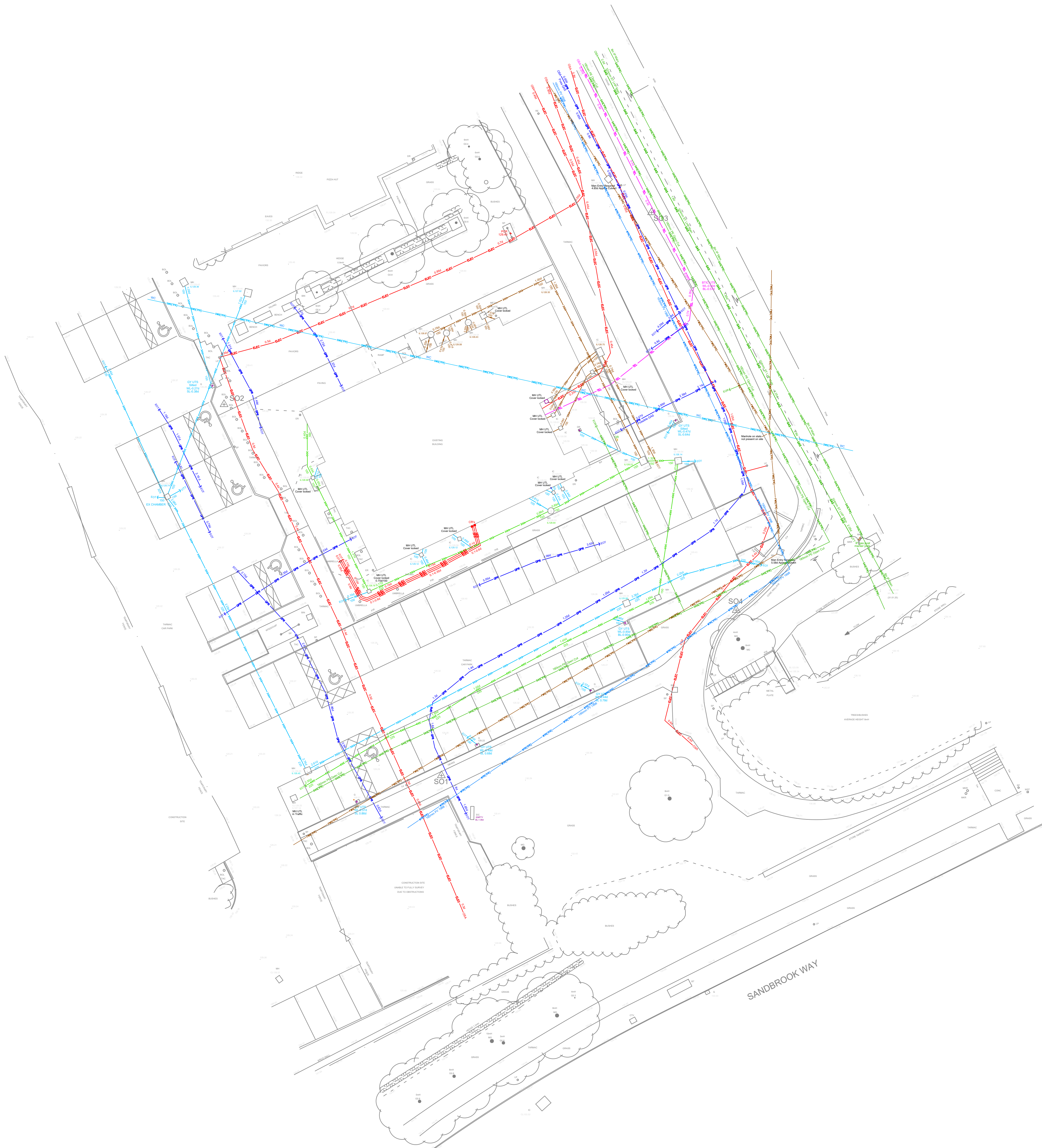
This record pack has been compiled from information provided by statutory utility providers.
whilst every effort has been made to ensure the accuracy
and completeness of information included within this report,

We take no responsibility for erroneous or missing historic record data which has been supplied
to us from a utility provider. Due to the nature of record
Information being indicative rather than accurate it is advisable
for a full site utility survey to be undertaken
prior to any groundwork's or construction.



224a Westwick Road, Greenhill, Sheffield, S8 7BZ
ctcelimited@gmail.com

Tel: 07593583614



SURVEY CO-ORDINATE SCHEDULE				STATION			
EASTING	NORTHING	EASTING	NORTHING	EASTING	NORTHING	EASTING	NORTHING

LAND SURVEY INFORMATION	
GRID	X
VERTICAL DATUM	HEIGHT ESTABLISHED VIA TRIMBLE VES NAVI NETWORK COMMERCIAL RTK GPS CORRECTION SERVICE

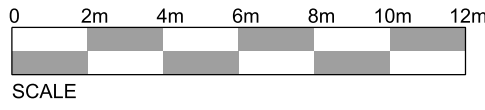
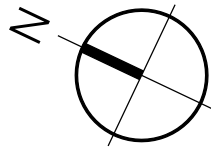
Electromagnetic and/or Ground Penetrating Radar techniques have been used to locate/trace underground utilities and features on this drawing. Carter Taylor Ltd has made every endeavour to make sure that the information contained within this drawing is accurate and of the highest quality. Carter Taylor Ltd has used any record drawings provided by the client or by the Statutory Utility Providers, at the client's request, at the time of the survey. Any information taken from these drawings (e.g. pipe sizes and position) is not guaranteed. Historic record information is often incomplete and inaccurate and cannot be relied upon.

Carter Taylor is not liable for any topographical survey that has not been undertaken by us. Any inaccuracies relating to topographical plans/development plans/Ordinance Survey data that we have no control over is the liability of the customer. Where quoted, depth information of underground services/features is stated. Depths are generally within +/- 10% accurate, but cannot be guaranteed. Any depths shown are drains are usually to invert (base of drainage channel) unless otherwise stated.

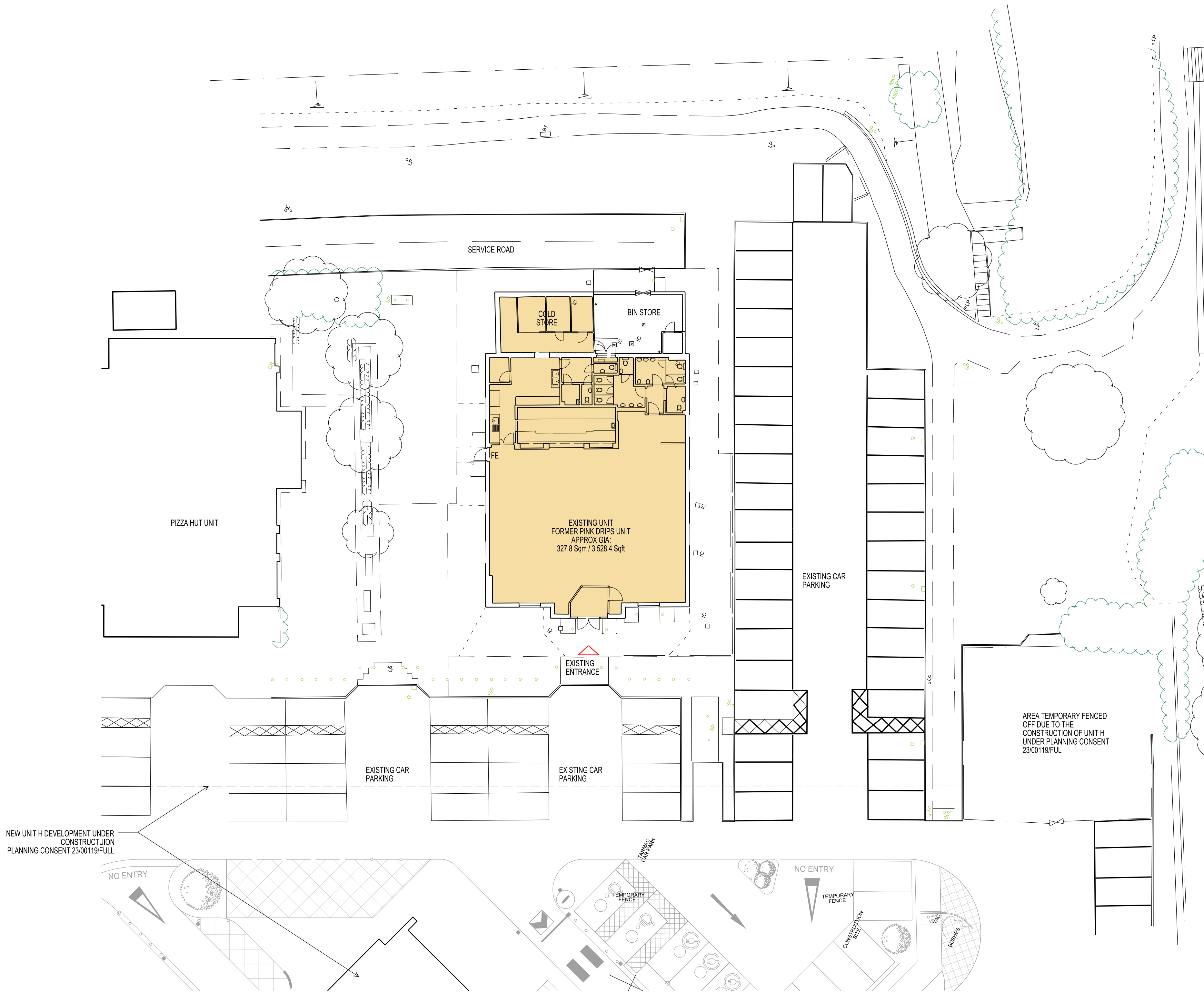
The completeness of any underground survey cannot be 100% guaranteed and the results from these types of surveys are not infallible. If the location or depth of services/features is of particular importance to a project then it is strongly advised that discussions are held with Carter Taylor Ltd regarding any possible limitations or anomalies. It is also strongly advised that trial excavations should be undertaken to confirm survey results. We cannot be held responsible for any inaccuracies beyond those that could be reasonably expected by a competent company.

ABBREVIATIONS (Land & Utilities)		
AA	ADDITIONAL	AD
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SI	ADDITIONAL	AD
SJ	ADDITIONAL	AD
SK	ADDITIONAL	AD

APPENDIX C: PROPOSED DEVELOPMENT



Survey drawings from:
Survey Operations
24C149/001 Topographical Survey
24C150/001 Ground Floor plan
Dated February 2025



B	10.09.25	PLANNING ISSUE	CF
A	16.07.25	DRAFT PLANNING ISSUE	CF
REV.	DATE	NOTES	INT.

CLIENT / PROJECT
AIG HOLDINGS LTD
SANDBROOK PARK, ROCHDALE
OL11 1RY
DRAWING TITLE
EXISTING SITE PLAN
FORMER PINK DRIPS UNIT

STATUS
PLANNING

DATE	21.02.2025	DRAWN	CF	SCALE @ A1 / A3	1:200
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PROJECT NUMBER	UNIT	CI / SPS CODE	TYPE A NUMBER	REVISION NUMBER	LETTER
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DRAWING NO.	11649	L	002	B
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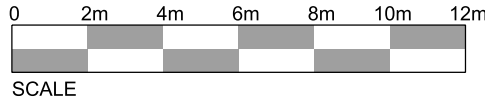
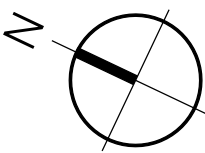
Site Location Plans	L	GA Plans	P	Elevations	E
Sections	S	Details	D	Photoc Colour	C

THE RATCLIFFE GROVES PARTNERSHIP

LONDON
18 BEERDOW ROAD
LONDON WC1R 4EB
T: 020 7608 6666 E: london@rgp.co.uk
www.rgp.co.uk

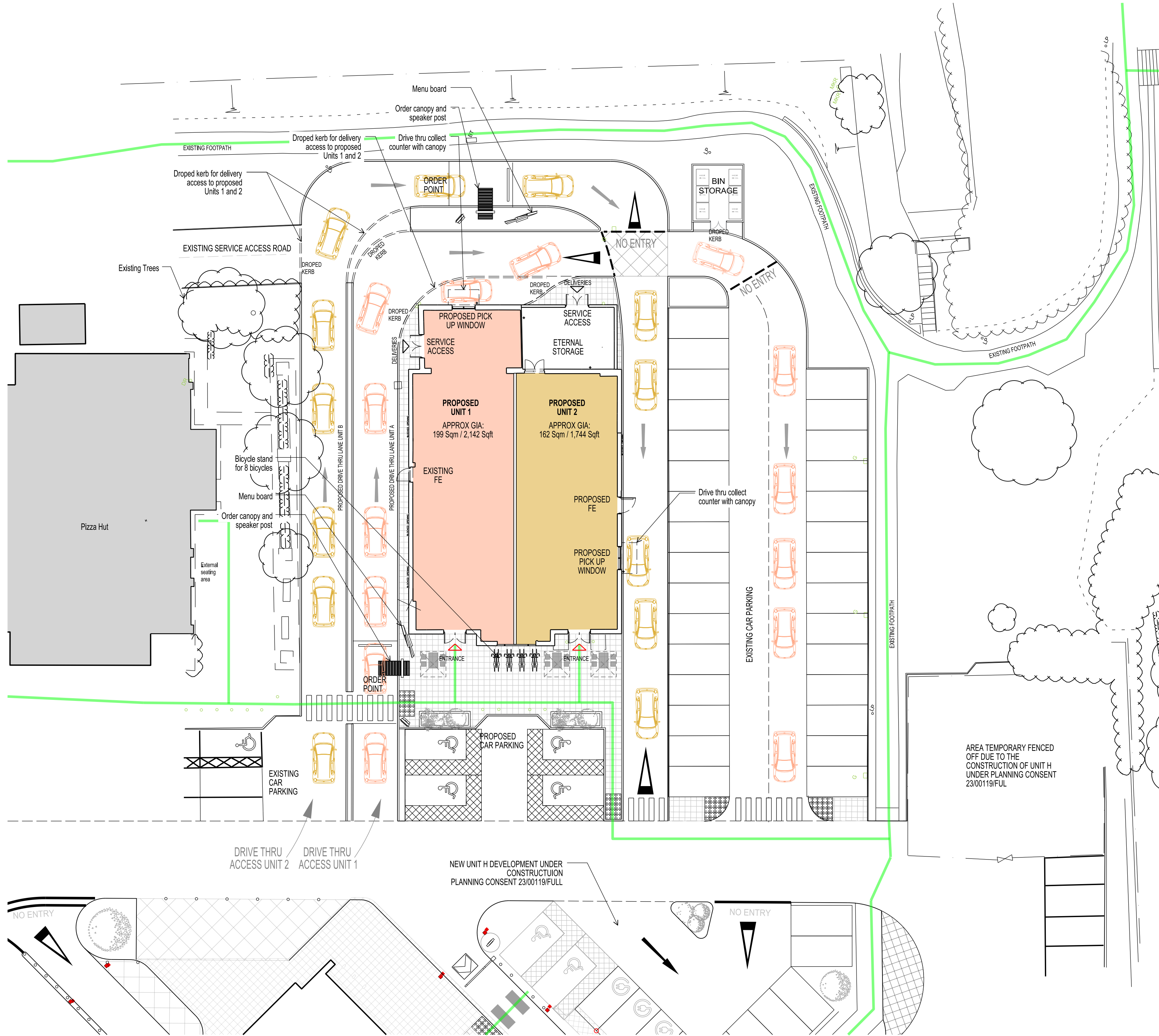
MANCHESTER
105 MANCHESTER ROAD
BURY LANCASHIRE BL9 9TD
T: 0161 797 6000 E: manchester@rgp.co.uk





Survey drawings from:
Survey Operations
24C149/001 Topographical Survey
24C150/001 Ground Floor plan
Dated February 2025

Pedestrian Linkage



C	20.08.25	SITE BOUNDARY AND CAR PARKING AMENDED	CF
B	16.07.25	DRAFT PLANNING ISSUE	CF
A	28.05.25	PEDESTRIAN LINKAGE SHOWN, OPTION 2 LAYOUT AMENDED	CF

REV. DATE NOTES

CLIENT / PROJECT
AIG HOLDINGS LTD
SANDBROOK PARK, ROCHDALE
OL11 1RY
DRAWING TITLE
PROPOSED SITE PLAN
FORMER PINK DRIPS UNIT
OPTION 2
STATUS
DRAFT PLANNING

DATE	24.02.2025	DRAWN	CF	SCALE @ A1 / A3	1:200
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PROJECT NUMBER	UNIT	CL / SPS	TYPE A	REVISION
11649	L	020	C	

DRAWING NO.	11649	L	020	C
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Site Location Plans	L	GA Plans	P	Sections	E
Sections	S	Details	D	Propic Colour	C

THE RATCLIFFE GROVES PARTNERSHIP

LONDON
18 BEER OGD ROAD
LONDON WC1R 4EB
T. 020 7608 6666 E. london@rgp.co.uk
www.rgp.co.uk

MANCHESTER
105 MANCHESTER ROAD
BURY LANCASHIRE BL9 9TD
T. 0161 797 6000 E. manchester@rgp.co.uk



APPENDIX D: EA RESPONSE

Rochdale Metropolitan Borough Council
Development Control
Number One Riverside
Smith Street
ROCHDALE
Lancashire
OL16 1XU

Our ref: SO/2026/125590/01-L01
Your ref: 25/01016/FUL
Date: 26 February 2026

Dear Sir/Madam

RECONFIGURATION OF SITE TO CREATE DUAL-LANE DRIVE-THRU FACILITY INCLUDING ALTERATIONS CAR PARK LAYOUT AND LANDSCAPING TO FACILITATE SUBDIVISION OF EXISTING RESTAURANT INTO TWO SEPARATE UNITS. ALTERATIONS TO EXTERNAL ELEVATIONS INCLUDING NEW DRIVE THRU PICK UP WINDOWS, ORDER CANOPIES AND BIN STORAGE.

FORMER PINK DRIPS UNIT SANDBROOK PARK SANDBROOK WAY, ROCHDALE, OL11 1RY

Thank you for referring the above application to the Environment Agency. We object to the proposed development, and we would like to make the following comments.

Environment Agency position

In the absence of a flood risk assessment (FRA), we object to this application and recommend that planning permission is refused.

Reason(s)

The application site contains land within Flood Zones 3 and 2, which is land defined by the planning practice guidance as having a high/medium probability of flooding, respectively. The NPPF (paragraph 181, footnote 63) and the Flood Risk and Coastal Change Planning Practice Guidance (paragraphs 20 and 21) state that an FRA must be submitted when development is proposed in such locations.

An FRA is vital to making informed planning decisions. In its absence, the flood risks posed by the development are unknown. This is sufficient reason for refusing planning permission.

While the land proposed for the development building is not within the current extent of FZ 3/2, an FRA is still necessary due to the close proximity and the likelihood of falling under one or both of these designations as a consequence of climate change over the next century.

Environment Agency
Richard Fairclough House Knutsford Road, Warrington, WA4 1HT.
Customer services line: 03708 506 506
www.gov.uk/environment-agency

Cont/d..

Overcoming our objection

To overcome our objection, the applicant should submit an FRA which demonstrates that the development is safe without increasing risk elsewhere. Where possible, it should reduce flood risk overall.

If this cannot be achieved, we are likely to maintain our objection. Please re-consult us if an FRA is submitted and we will respond within 21 days of re-consultation. Guidance on how to prepare a flood risk assessment can be found at [Flood risk assessments: applying for planning permission - GOV.UK](#).

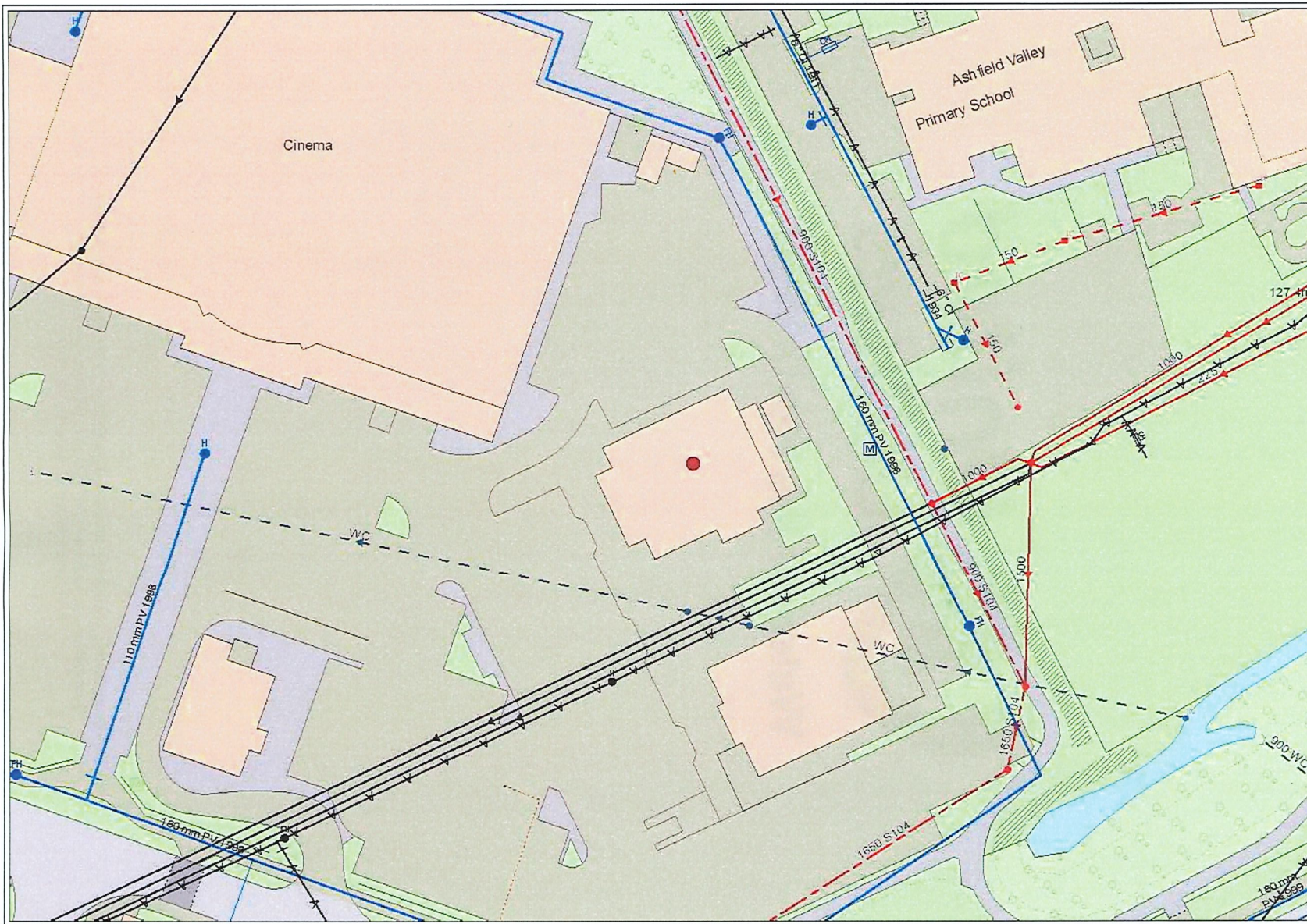
Please forward a copy of this letter to the applicant.

Yours faithfully

Mrs. SYLVIA WHITTINGHAM
Planning Advisor

Direct e-mail SPPlanning.RFH@environment-agency.gov.uk

APPENDIX E: UTILITIES MAPS



United Utilities Maps for SafeDig

Date : 04/12/2025 08:26:00

Centre X: 389266

Centre Y: 411802

Scale : 500

UserName:

Extract from maps of United Utilities' Underground Assets

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private service pipes may be shown by a blue broken line. United Utilities Water will not accept liability for any damage caused by the actual position being different from those shown.

Crown copyright and database rights 2025 Ordnance Survey 0600813445. This plan is based on the Ordnance Survey Map with the sanction of the Controller of H.M. Stationary Office. Crown and United Utilities Water copyrights are reserved. Unauthorised reproduction will infringe these copyrights.



APPENDIX F: DRAINAGE LAYOUT

1. Where this drawing has been issued in electronic .dwg format, it has been done so in good faith. JNP Group do not take any responsibility for any inaccuracies in the electronic data, which should be checked against the paper (or .pdf) drawing issue. Any apparent discrepancies should be immediately reported to JNP Group. The electronic .dwg file should not be assumed to be scale and should not be used for 'overlying', setting out or checking of any third party information. All dimensions should be taken from the paper (or .pdf) version of the drawing. Electronic drawings may contain third party information. JNP Group take no responsibility for this information, which should be checked against the originators paper drawing(s).
2. All dimensions are millimetres (mm), and levels are in metres (m) unless noted otherwise and should be checked on site prior to construction/fabrication.
3. Do not scale from this drawing. Only figured dimensions are to be relied upon. Do not hesitate to get in touch with JNP Group if additional information is required.
4. Any discrepancies between drawings of different scales and between drawings and specifications, where appropriate, to be reported to JNP Group for decision.
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6. This drawing should only be used for construction if the drawing status is "A4 - Approved/Stage Complete". JNP Group takes no responsibility for construction works undertaken to drawings that are not marked with this status.

Health & Safety Note

The details on this drawing have been prepared on the assumption that a competent contractor will be carrying out the works. If the contractor(s) considers that there is insufficient Health and Safety information on this drawing, this should immediately be brought to the attention of the designer.

Legend

-  Existing Surface Water Sewer
 Existing Combined Sewer
 Existing Foul Water Sewer
 Proposed Surface Water Sewer
 Proposed Attenuation Tank

Drawing References

- Topographical information provided by Survey Operations drawing ref. 24C149/001
- Site Layout provided by RGP Architects drawing ref. 11649
- Existing drainage provided by Carter Taylor drawing ref. 7014-CAR-001

Notes

- 0.045ha of new impermeable area is proposed to be built.
 - As the site is remaining largely unchanged, a new drainage network is only required for the new drive through.
 - A greenfield runoff rate of 11ls has been established to minimise the impact on the existing network.
 - To achieve the required water quality stated by the Ciria SuDS Manual, a Vortex Separator has been proposed.
 - An attenuation tank (volume 26.1m³) has been proposed.
 - All proposed manhole cover levels and invert levels are indicative, these are likely to be updated once the road levels are finalised.

drawings and specifications, where appropriate, to be reported to JNP Group for decision.

 5. Copyright reserved. This drawing may only be used for The Client and location specified in the title block. It may not be copied or disclosed to any third party without the prior written consent of JNP Group.
 6. This drawing should only be used for construction if the drawing status is "As Approved/Stage Complete". JNP Group takes no responsibility for construction works undertaken to drawings that are not marked with this status.



Health & Safety Note

The details on this drawing have been prepared

P01	30/06/2026	First Issue		HCIAS/RSI
Ref	Date	Description	Dm / CHSD / App	
Suitable				
S2 - Suitable for Information				



Client:	Stantec		
Job:	Former Pink Drips Unit, Sandbrook Park		
Title:	Preliminary Drainage Strategy Option 2		
Classification:	    		
Scale @ A1	1:200		
Project / Originator / Volume/System / Levels/Location / Type / Discipline / Number			Revision
S13111 - JNP-XX-XX- DR -C- 7001			P01

APPENDIX G: MICRODRAINAGE CALCULATIONS

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
1	0.040	5.00	129.490	450	-8.852	60.000	1.350	128.140
2			129.530	450	9.285	59.936	2.160	127.370
3			129.440	450	20.386	58.167	2.380	127.060
4			129.360	450	24.300	40.498	2.710	126.650
6			129.550	450	16.137	26.295	3.300	126.250
7			129.540	450	0.704	26.184	3.470	126.070
8			129.410	1200	0.816	15.895	3.400	126.010
9		5.00	129.340	1200	0.928	4.936	3.330	126.010
10			129.340	1200	1.040	-5.912	3.360	125.980
11	0.005	5.00	129.540	450	-14.332	25.592	2.090	127.450

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	15.826	0.600	128.140	127.420	0.720	22.0	150	5.12	50.0
1.001	2	3	5.872	0.600	127.370	127.060	0.310	18.9	150	5.16	50.0
1.002	3	4	11.811	0.600	127.060	126.650	0.410	28.8	150	5.27	50.0
1.004	6	7	6.891	0.600	126.250	126.070	0.180	38.3	150	5.39	50.0
1.005	7	8	2.447	0.600	126.070	126.040	0.030	81.6	150	5.42	50.0
3.000	9	10	1.930	0.600	126.010	125.980	0.030	64.3	150	5.03	50.0
2.000	11	7	13.808	0.600	127.450	126.070	1.380	10.0	150	5.07	50.0
1.003	4	6	7.054	0.600	126.650	126.250	0.400	17.6	150	5.32	50.0

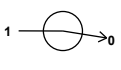
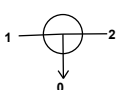
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	2.157	38.1	7.2	1.200	1.960	0.040	0.0	44	1.666
1.001	2.325	41.1	7.2	2.010	2.230	0.040	0.0	42	1.756
1.002	1.883	33.3	7.2	2.230	2.560	0.040	0.0	47	1.505
1.004	1.631	28.8	7.2	3.150	3.320	0.040	0.0	51	1.363
1.005	1.114	19.7	8.1	3.320	3.220	0.045	0.0	67	1.061
3.000	1.256	22.2	0.0	3.180	3.210	0.000	0.0	0	0.000
2.000	3.203	56.6	0.9	1.940	3.320	0.005	0.0	13	1.178
1.003	2.410	42.6	7.2	2.560	3.150	0.040	0.0	42	1.807

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	15.826	22.0	150	Circular	129.490	128.140	1.200	129.530	127.420	1.960
1.001	5.872	18.9	150	Circular	129.530	127.370	2.010	129.440	127.060	2.230
1.002	11.811	28.8	150	Circular	129.440	127.060	2.230	129.360	126.650	2.560
1.004	6.891	38.3	150	Circular	129.550	126.250	3.150	129.540	126.070	3.320
1.005	2.447	81.6	150	Circular	129.540	126.070	3.320	129.410	126.040	3.220
3.000	1.930	64.3	150	Circular	129.340	126.010	3.180	129.340	125.980	3.210
2.000	13.808	10.0	150	Circular	129.540	127.450	1.940	129.540	126.070	3.320
1.003	7.054	17.6	150	Circular	129.360	126.650	2.560	129.550	126.250	3.150

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	450	Manhole	Adoptable	2	450	Manhole	Adoptable
1.001	2	450	Manhole	Adoptable	3	450	Manhole	Adoptable
1.002	3	450	Manhole	Adoptable	4	450	Manhole	Adoptable
1.004	6	450	Manhole	Adoptable	7	450	Manhole	Adoptable
1.005	7	450	Manhole	Adoptable	8	1200	Manhole	Adoptable
3.000	9	1200	Manhole	Adoptable	10	1200	Manhole	Adoptable
2.000	11	450	Manhole	Adoptable	7	450	Manhole	Adoptable
1.003	4	450	Manhole	Adoptable	6	450	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	-8.852	60.000	129.490	1.350	450				
						0	1.000	128.140	150
2	9.285	59.936	129.530	2.160	450		1	1.000	127.420
						0	1.001	127.370	150
3	20.386	58.167	129.440	2.380	450		1	1.001	127.060
						0	1.002	127.060	150
4	24.300	40.498	129.360	2.710	450		1	1.002	126.650
						0	1.003	126.650	150
6	16.137	26.295	129.550	3.300	450		1	1.003	126.250
						0	1.004	126.250	150
7	0.704	26.184	129.540	3.470	450		1	2.000	126.070
						2	1.004	126.070	150
						0	1.005	126.070	150



Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
8	0.816	15.895	129.410	3.400	1200	 1	1.005	126.040	150
9	0.928	4.936	129.340	3.330	1200	 0	3.000	126.010	150
10	1.040	-5.912	129.340	3.360	1200	 1	3.000	125.980	150
11	-14.332	25.592	129.540	2.090	450	 0	2.000	127.450	150

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	20.0		

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
2	0	0	0
30	0	0	0
100	45	0	0

Node 9 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	126.010	Product Number	CTL-SHE-0049-1000-0800-1000
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.0	Min Node Diameter (mm)	1200

Node 9 Tank Storage Structure

Invert Level (m)	126.010	Analyse flow through structure	x
Time to half empty (mins)			

Inlets

8

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	32.6	0.800	32.6	0.801	0.0



Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	128.174	0.034	4.1	0.0254	0.0000	OK
15 minute summer	2	10	127.403	0.033	4.1	0.0052	0.0000	OK
15 minute summer	3	10	127.097	0.037	4.0	0.0059	0.0000	OK
15 minute summer	4	10	126.681	0.031	4.0	0.0050	0.0000	OK
15 minute summer	6	11	126.288	0.038	4.0	0.0060	0.0000	OK
15 minute summer	7	11	126.126	0.056	4.5	0.0088	0.0000	OK
240 minute summer	8	148	126.122	0.111	2.0	0.0000	0.0000	OK
240 minute summer	9	152	126.117	0.107	1.3	3.6743	0.0000	OK
240 minute summer	10	152	126.000	0.020	0.8	0.0000	0.0000	OK
15 minute summer	11	11	127.460	0.010	0.5	0.0021	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	4.1	1.388	0.106	0.0463	
15 minute summer	2	1.001	3	4.0	1.304	0.098	0.0182	
15 minute summer	3	1.002	4	4.0	1.332	0.121	0.0357	
15 minute summer	4	1.003	6	4.0	1.311	0.094	0.0216	
15 minute summer	6	1.004	7	4.0	0.865	0.139	0.0324	
15 minute summer	7	1.005	8	4.5	0.834	0.231	0.0133	
240 minute summer	9	3.000	10	0.8	0.570	0.037	0.0028	7.2
15 minute summer	11	2.000	7	0.5	0.715	0.009	0.0444	

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	128.182	0.042	6.3	0.0318	0.0000	OK
15 minute summer	2	10	127.411	0.041	6.2	0.0065	0.0000	OK
15 minute summer	3	10	127.107	0.047	6.2	0.0074	0.0000	OK
15 minute summer	4	10	126.689	0.039	6.2	0.0062	0.0000	OK
15 minute summer	6	10	126.298	0.048	6.2	0.0076	0.0000	OK
240 minute summer	7	152	126.159	0.089	2.7	0.0141	0.0000	OK
240 minute summer	8	152	126.159	0.149	2.6	0.0000	0.0000	OK
240 minute summer	9	156	126.154	0.144	1.7	4.9224	0.0000	OK
240 minute summer	10	156	126.001	0.020	0.9	0.0000	0.0000	OK
15 minute summer	11	11	127.463	0.013	0.8	0.0026	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	6.2	1.565	0.164	0.0631	
15 minute summer	2	1.001	3	6.2	1.455	0.152	0.0251	
15 minute summer	3	1.002	4	6.2	1.493	0.186	0.0491	
15 minute summer	4	1.003	6	6.2	1.452	0.145	0.0301	
15 minute summer	6	1.004	7	6.2	0.947	0.213	0.0452	
240 minute summer	7	1.005	8	2.6	0.603	0.133	0.0316	
240 minute summer	9	3.000	10	0.9	0.582	0.040	0.0029	9.4
15 minute summer	11	2.000	7	0.8	0.730	0.014	0.0619	



Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	128.212	0.072	16.3	0.0541	0.0000	OK
15 minute summer	2	10	127.442	0.072	16.2	0.0114	0.0000	OK
15 minute summer	3	10	127.140	0.080	16.2	0.0128	0.0000	OK
15 minute summer	4	10	126.717	0.067	16.1	0.0106	0.0000	OK
240 minute summer	6	176	126.385	0.135	5.0	0.0215	0.0000	OK
240 minute summer	7	176	126.385	0.315	5.5	0.0501	0.0000	SURCHARGED
240 minute summer	8	176	126.385	0.375	5.4	0.0000	0.0000	OK
240 minute summer	9	176	126.379	0.369	3.1	12.5050	0.0000	SURCHARGED
30 minute summer	10	24	126.001	0.021	0.9	0.0000	0.0000	OK
15 minute summer	11	10	127.469	0.019	2.0	0.0040	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	16.2	2.007	0.425	0.1277	
15 minute summer	2	1.001	3	16.2	1.806	0.393	0.0525	
15 minute summer	3	1.002	4	16.1	1.877	0.484	0.1014	
15 minute summer	4	1.003	6	16.1	1.708	0.377	0.0663	
240 minute summer	6	1.004	7	4.9	0.700	0.172	0.1182	
240 minute summer	7	1.005	8	5.4	0.519	0.275	0.0431	
240 minute summer	9	3.000	10	0.9	0.591	0.042	0.0030	20.2
15 minute summer	11	2.000	7	2.0	0.384	0.035	0.1262	



Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.25%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	128.249	0.109	29.9	0.0816	0.0000	OK
15 minute summer	2	11	127.481	0.111	29.7	0.0177	0.0000	OK
30 minute summer	3	19	127.237	0.177	28.6	0.0282	0.0000	SURCHARGED
30 minute summer	4	20	126.899	0.249	28.2	0.0396	0.0000	SURCHARGED
240 minute winter	6	228	126.793	0.543	5.9	0.0863	0.0000	SURCHARGED
240 minute winter	7	228	126.793	0.723	6.4	0.1149	0.0000	SURCHARGED
240 minute winter	8	228	126.793	0.783	6.3	0.0000	0.0000	OK
240 minute winter	9	232	126.786	0.776	3.6	26.1933	0.0000	SURCHARGED
240 minute winter	10	232	126.001	0.021	1.0	0.0000	0.0000	OK

15 minute summer	11	10	127.476	0.026	3.7	0.0054	0.0000	OK
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Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	29.7	2.276	0.778	0.2061	
15 minute summer	2	1.001	3	29.6	2.001	0.720	0.0929	
30 minute summer	3	1.002	4	28.2	2.001	0.849	0.2079	
30 minute summer	4	1.003	6	27.2	1.745	0.638	0.1242	
240 minute winter	6	1.004	7	5.7	0.687	0.199	0.1213	
240 minute winter	7	1.005	8	6.3	0.588	0.319	0.0431	

240 minute winter	9	3.000	10	1.0	0.598	0.044	0.0031	23.0
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15 minute summer	11	2.000	7	3.7	1.043	0.065	0.1356	
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