# Lane End Road

# Burnage

# M19 1WA

# DRAINAGE STRATEGY

## On Behalf Of

## HASAZA ESTATES LIMITED

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# 1 INTRODUCTION

## Scope of Appraisal

1.1 HBL Associates Ltd have been instructed by Hasaza Estates Limited to prepare a Drainage Strategy for a new residential block of apartments at Lane End Road, Burnage, M19 1WA, United Kingdom.

| SITE NAME | Lane End Road |
|---|---|
| PROJECT DESCRIPTION | Demolition of the existing buildings and erection of a mixed-use development with retail (Use Class E) at the ground floor and residential development (Use Class C3) and roof terrace above, in addition to car parking, landscaping, and associated infrastructure. |
| LOCATION | Lane End Road, Burnage, M19 1WA, United Kingdom. |
| NGR (APPROXIMATE) | SJ859915 |
| APPLICATION SITE (HA) - RED BOUNDARY LINE | 0.15Ha |
| DEVELOPMENT TYPE | Brownfield |
| LOCAL PLANNING AUTHORITY | Manchester City Council |
| LOCAL LEAD FLOOD AUTHORITY | Manchester City Council |
| SEWERAGE UNDERTAKER IN THE AREA | United Utilities |

*Table 1 - Site Details*

1.2 Sources of flooding will be assessed as part of the Drainage Strategy for the proposed development in its current context.

1.3 This document is to be read in conjunction with all associated drawings, supported reports and documentation.

1.4 The report follows advice contained in the Department for Communities and Local Government's National Planning Policy Framework (NPPF) and Planning Practice Guidance, which provides advice to planning authorities, developers, the public and Environment Agency (EA) on development and flood risk.

## 2. SITE LOCATION AND TOPOGRAPHY

2.1 The subject site is irregular in shape and covers an area of approximately 0.15 hectares within the Burnage Ward of Manchester, under the postcode M19 1WA. The site lies within a well-established suburban area, approximately 6.5 km south of Manchester City Centre. It is situated on the northern side of Fog Lane, a key local route connecting the A34 Kingsway to the west and Didsbury to the east. The site's Ordnance Survey National Grid Reference is SJ8593791546 (Easting: 385937, Northing: 391546).

2.2 The site is located on gently sloping terrain, with an elevation of approximately 40m Above Ordnance Datum (AOD). The surrounding topography presents no significant gradient changes or physical constraints that would impact development or accessibility. Surface water drainage is managed through existing infrastructure, with no recorded flood risk in the immediate vicinity, as indicated by the Environment Agency flood risk mapping.

2.3 The existing site comprises of a pharmacy, restaurant, car parking, green space, and some overgrown areas. It is bounded to the north, south, and west by Lane End Road, the A34, and Fog Lane respectively. Existing housing and commercial premises are located along the eastern boundary of the site.

2.4 The site location, current layout, and red line planning boundary are illustrated in Figure 1, as well as in the topographical survey provided in *Appendix A*.




*Figure 1 - Site Location Plan*

## 3. EXISTING GROUND CONDITIONS

3.1 A phase 1 site investigation has been carried out by HBL on behalf of the client which can be read as a standalone report under 11051-HBL-XX-XX-RP-C-0001. It concludes that made ground is likely to be present at surface, associated with the previous development at the site.

3.2 Basements may have been present to the demolished bank building and (less likely) to the terraced housing. Below the made ground, British Geological Survey (BGS) and Groundsure information shows the site to be covered by drift deposits (glacial clay), with Triassic bedrock of the Chester Formation at depth.

3.3 The BGS describes the formation as: *"Conglomerates and reddish brown, cross-bedded, pebbly sandstones with subordinate beds of red-brown mudstone. The conglomerates have a reddish-brown sandy matrix and consist mainly of pebbles of brown or purple quartzite, with quartz conglomerate and vein quartz. The formation generally fines upwards, from dominantly conglomerates at the base, to interbedded conglomerates and sandstones, with sandstone and pebbly sandstone predominant in the upper part, and rare mudstones"*

3.4 The 1:10,560 map shows a borehole or sewer shaft adjacent to the site on Kingsway which has proved clay to 11½ feet (3.5m) and red sandstone to 25 feet (7.6m). Two wells are shown on the map adjacent to the Renold Chain Works and are also available on the BGS online borehole database. The wells are approximately 300m (SJ89SE35) and 450m (SJ89SE20) SE of the site, indicating drift to 11.6m and 15.2m respectively, with red sandstones and marl bands proved to be at least 107.4m and 71.9m, respectively. The well records are presented in Appendix *G* of the Site Investigation.

### SI summary

3.5 There may be infilled cellars/bank vaults associated with previous developments.

3.6 Clay soils are anticipated below the made ground, and large mature trees are present to the perimeters. Clay soils can exhibit seasonal movement in relation to moisture content change, particularly in the presence of existing, removed, or proposed trees. Laboratory testing of the soils will be required to fully assess this together with a tree survey.

3.7 Deepened foundations may be required to accommodate building loads and or clay shrink/swell risk.

3.8 Bedrock present at relatively shallow depth, possibly only at 3.5m depth but likely to be deeper closer to the fault in the south.

3.9 There is a major fault shown to be present running along the southwestern boundary of the site but there is a low risk of fault movement occurring that would cause significant damage to a modern, well-constructed building and no specific engineering mitigation measures are anticipated due to the fault.

3.10 Mining related risk is negligible.

3.11 The site is not suitable for soakaways due to the presence of made ground atop drift deposits of glacial till with poor infiltration properties. Proximity of existing and proposed buildings also makes them unviable.

## 4. FLOOD RISK

4.1 Government issued flood mapping shows that the site sits within flood zone 1 which indicates a low probability of flooding from rivers and sea. This zone has the lowest risk and indicates a 0.1% annual probability of flooding. (**Figure 2**)




*Figure 2 - Environment Agency Flood Zone*

4.2 The Risk of Flooding from Rivers and the Sea (RoFRaS) rating for the area is very low, (with a less than 1 in 1000 chance of flooding in any given year). The site is not within 250m of any flood defences, areas benefitting from flood defences or areas of flood storage. (**Figure 3**).

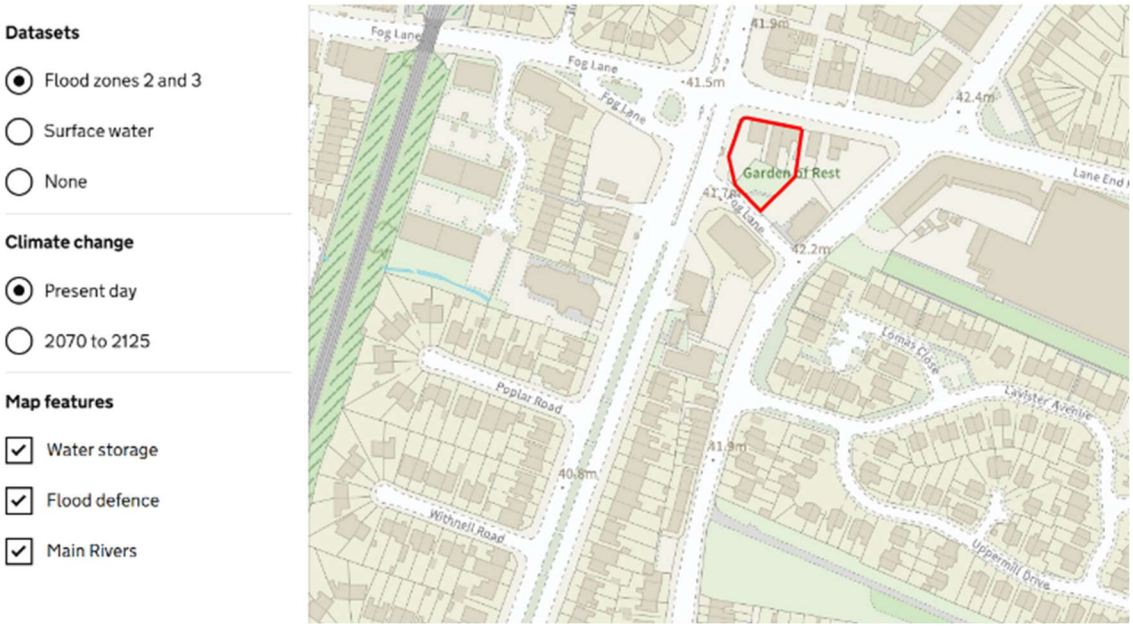



*Figure 3 - Environment Agency Risk of Flooding from Rivers and Sea*

### Surface Water Flooding Risk- Current

4.3 The mapping provided indicates a potential medium risk of surface water flooding within the site boundary, as shown in the flood extent map (**Figure 4**). The predicted extent of flooding during a high-frequency event is confined to the car park area located to the south of the buildings. However, this mapping is based on LiDAR data and highlights a localised low spot, without accounting for the presence or effectiveness of existing drainage infrastructure. CCTV surveys included in *Appendix B* of this report, confirm that the car park is currently served by existing gullies. Therefore, the surface water flood mapping may not accurately represent the actual flood risk on site.

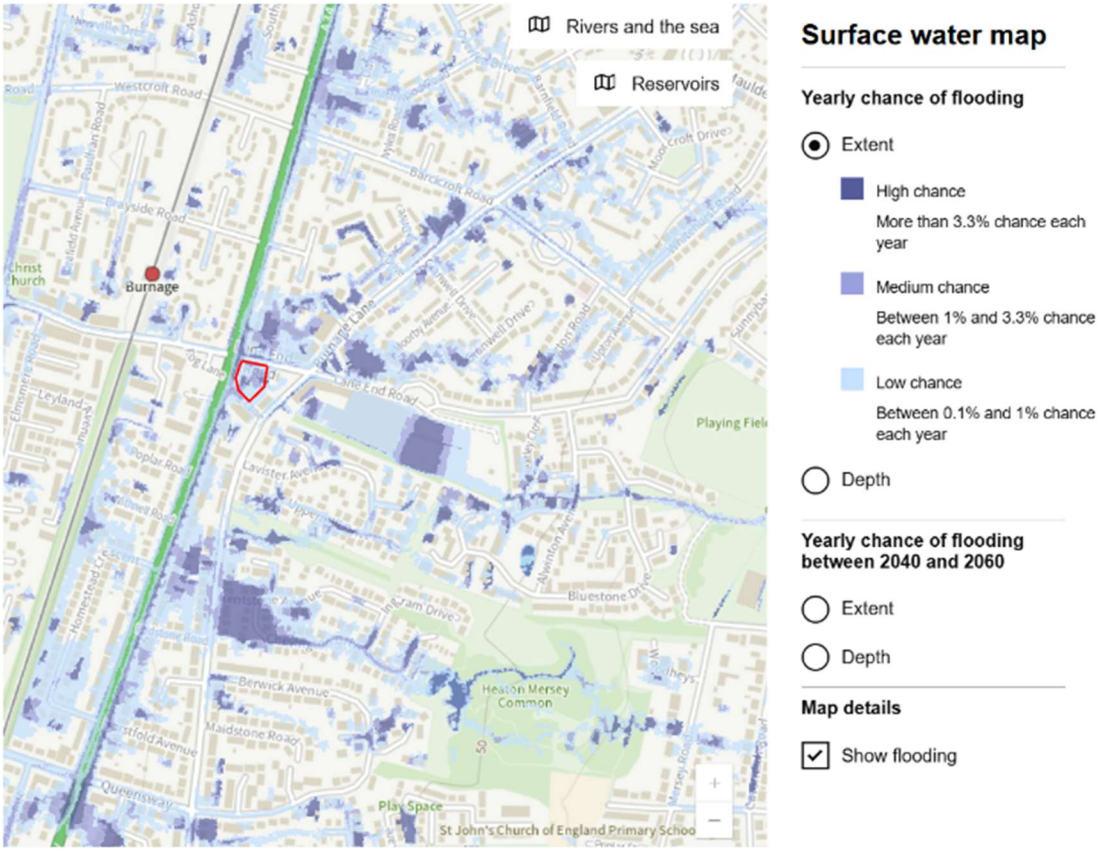



*Figure 4 - Environment Agency Extent of Surface water flooding*

4.4 The current risk of surface water flooding up to a depth of 20 cm is generally low across the site. However, LiDAR data identifies isolated areas where there is a medium probability (0.1–1%) of flooding. As previously noted, these areas appear to be concentrated around existing gullies, indicating that localized site levels are the likely cause of this risk. This can be appropriately mitigated through the proposed drainage strategy and by setting suitable site levels during design.

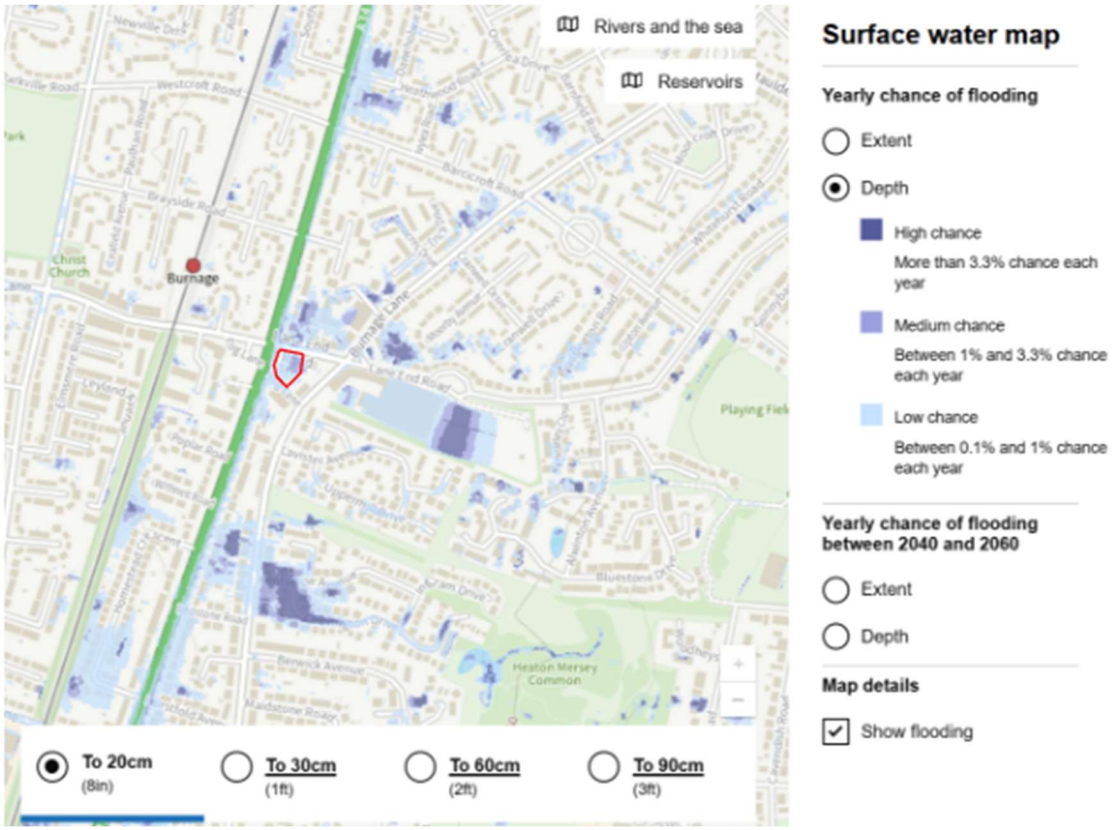



*Figure 5 - Environment Agency frequency of 20cm depth flooding*

4.5 Similarly, the depth map indicates that the maximum depth of water expected in the low frequency event is up to 30cm. As this is isolated to the depressions around existing gullies it is safe to assume that the existing drainage currently limits the depth of water to less than what is modelled through LiDAR. The proposed drainage and levels strategy must consider this, and the impact on surrounding properties, ensuring the design reduces the risk of surface water flooding.

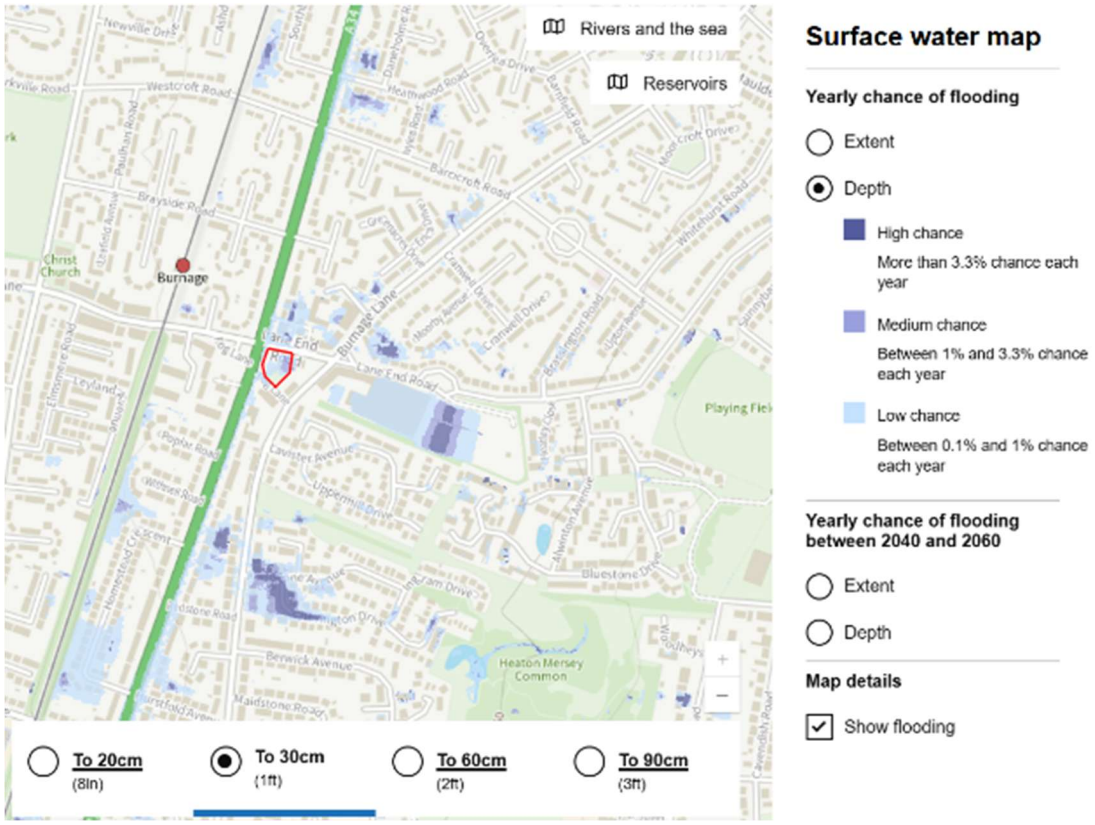



*Figure 6 - Environment Agency frequency of 30cm depth flooding*

4.6 The effect of climate change should also be considered, with the extent and depth of flooding likely to increase as we move towards 2060. The extent of flooding with a high chance of occurring is expected to increase, encompassing larger areas of the site as shown in **Figure 7**.

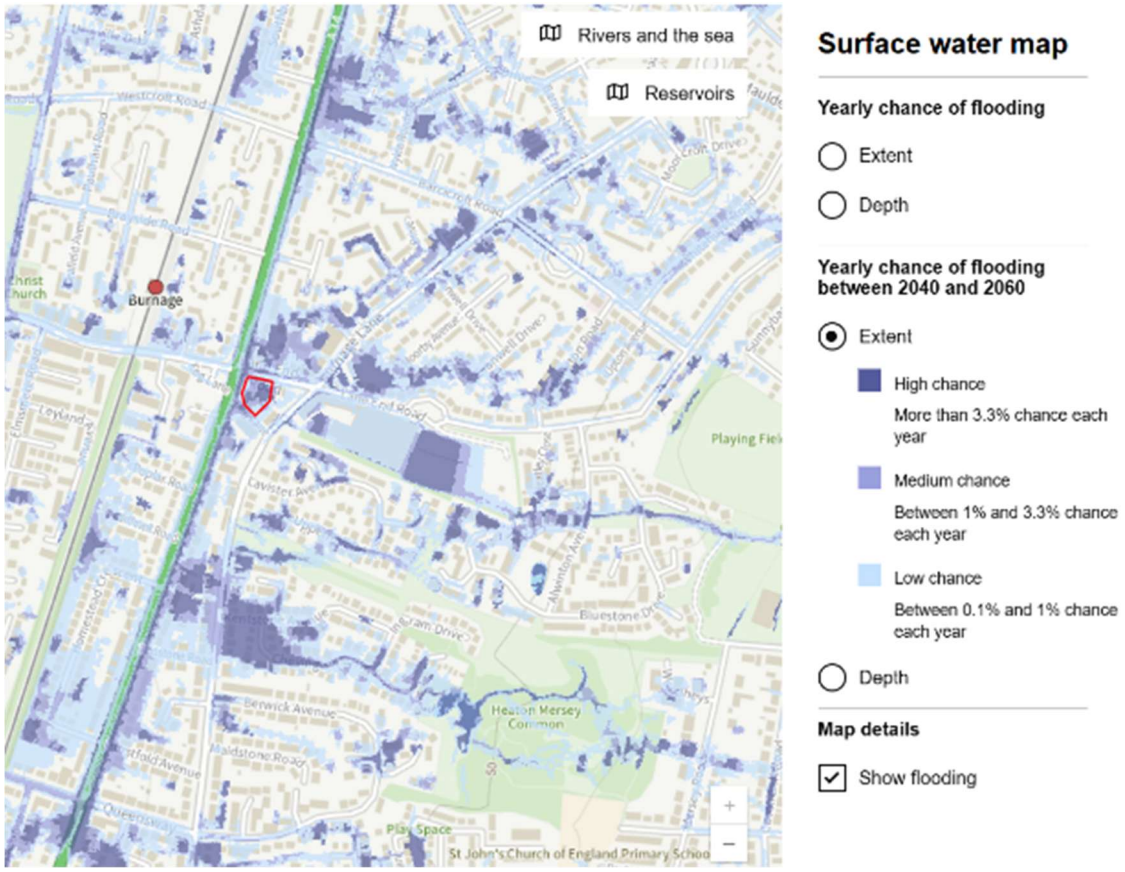



*Figure 7 - Environment Agency future extent of surface water flooding by 2040-2060*

4.7 The site exhibits gentle falls from the northwest to the southeast, with the observed surface water flooding likely resulting from localised overland flow originating from the A34 (Kingsway). An apparent overland flow route runs north to south along the road's kerb line. The site layout should take this into account and be designed to avoid disrupting this existing flow path.

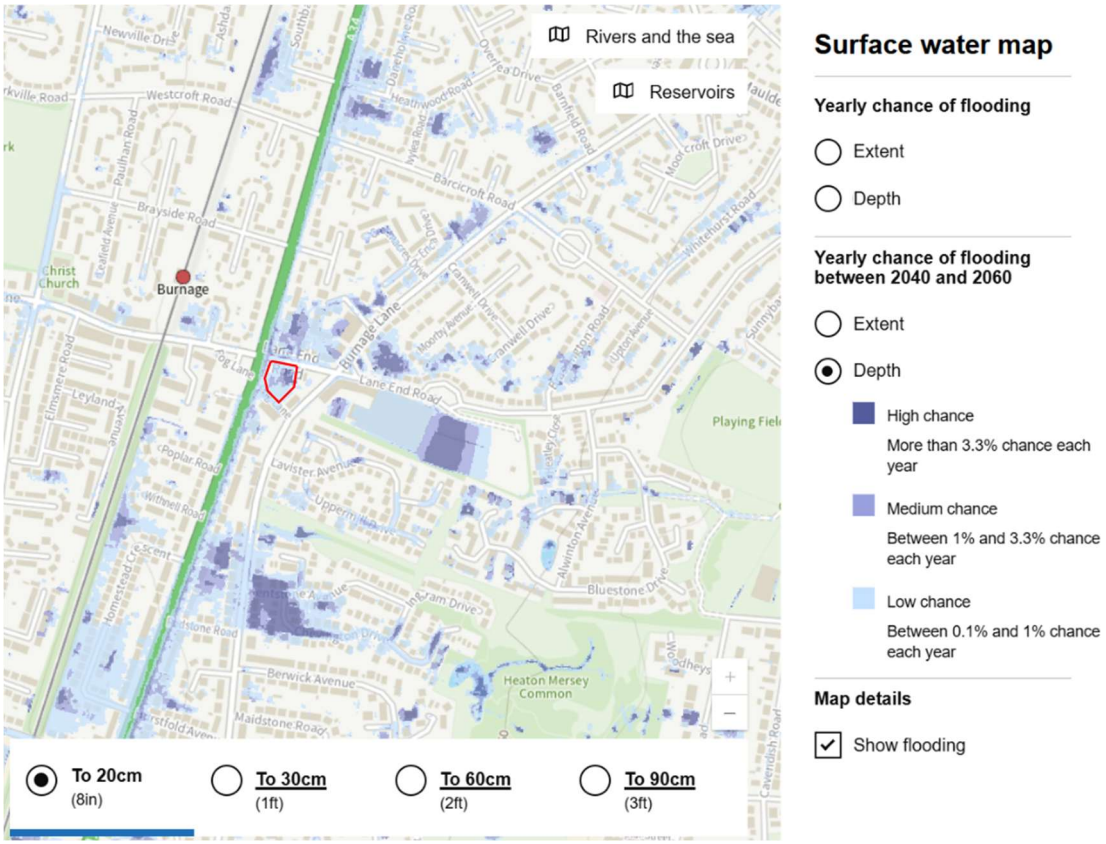



*Figure 8 - Environment Agency future extend of 20cm flooding by 2040-2060*

4.8 The expected depth of flooding is not expected to exceed 30cm within the site boundary for low chance events (0.1-1% probability), as shown in **Figure 9**.

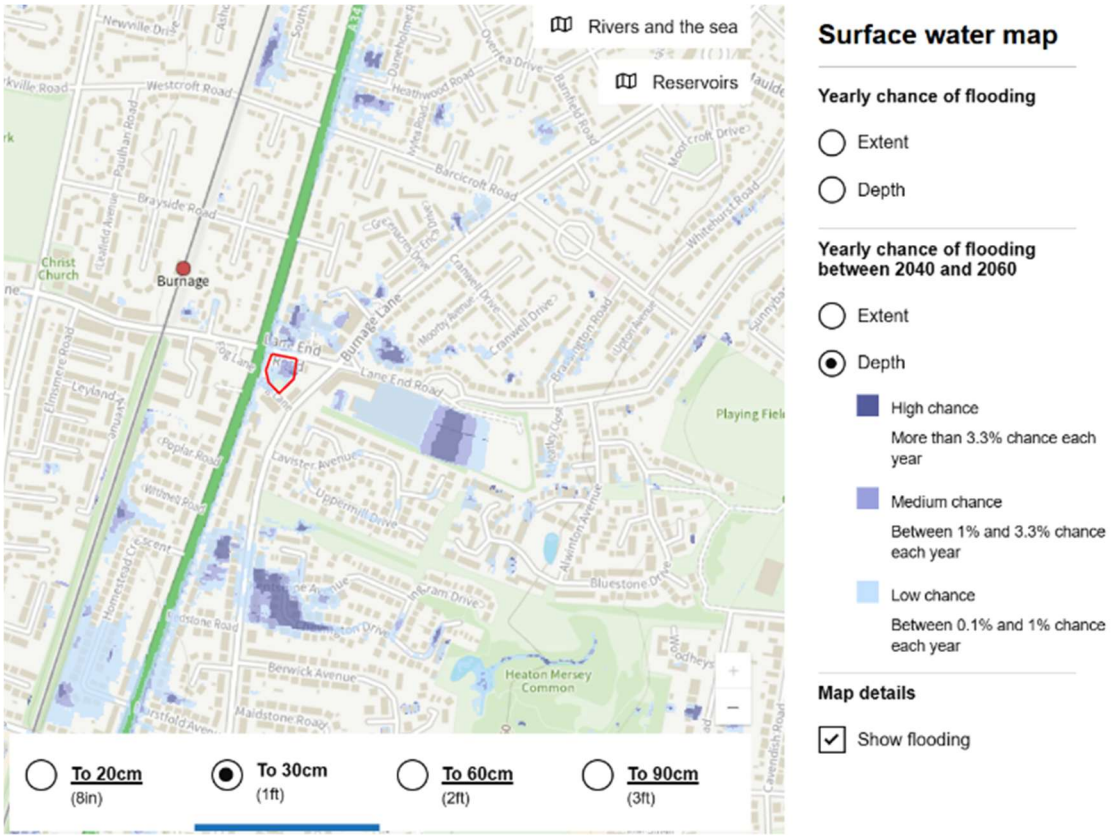



*Figure 9 - Environment Agency future extend of 30cm flooding by 2040-2060*

4.9 Based on the above, the overall risk of surface water flooding on this site is low, however the risk of localised flooding on site is currently managed by the existing drainage. Care should be taken to preserve existing overland flow routes and direct water away from the proposed building. Developing in this area presents an opportunity to manage surface water in a better way, potentially removing the risk of flash flooding though the use of SuDS such as green roofs, blue roofs, permeable paving and below ground attenuation.

## Reservoir Flooding

4.10 The available information for the environment agency shows the site is not identified as at risk of reservoir flooding under normal conditions, there is also no identified risk even when there is also flooding from rivers.

## 5. EXISTING DRAINAGE CHARACTERISTICS

5.1 Sewers within the area are managed by United Utilities.

5.2 A preplanning enquiry has been submitted to United Utilities and capacity in the surrounding network has been confirmed. The property is currently connected into the public combined sewer beneath Kingsway Road.

5.3 The site is made up of both existing hard landscaping, and the building which has been demonstrated to drain positively to the existing combined network, as well as some soft landscaping which is currently not connected to any existing drainage. In line with guidance the existing run off rate will be calculated for the brownfield run off rate for the positively drained area on site.

5.4 There is no surface water drainage infrastructure within the site. United Utilities asset maps indicate no surface water sewer bounding the applicant site, with the currently on-site surface water combining on site and connecting to the public combined sewer.

5.5 The existing private drainage on site has undergone a CCTV survey, attached in *Appendix B*. This survey identified some existing runs currently blocked; however, some of these drains appear to be serving multiple properties and United Utilities have confirmed that these sewers would have been transferred to them under the Water Industry Act 1991. However, due to the properties now being under the ownership of the developer, it is intended that this existing public sewer is decommissioned and a separate network proposed to serve the new development.

5.6 An additional private drain runs from outside of the survey boundary into MH1, this has been traced approximately and the head of the run appears to be a channel drain in public land outside the site boundary.

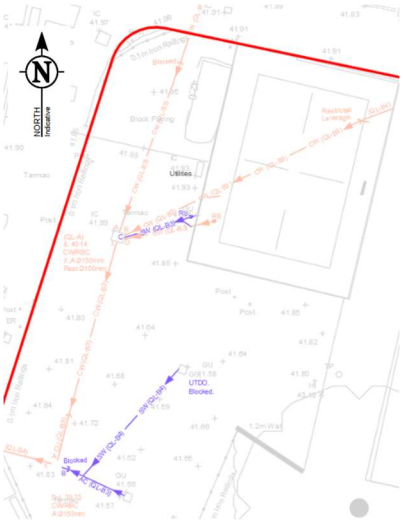



*Figure 10 - Existing MH1 drainage connections*

5.7 United Utilities have confirmed that various options are available, from an S185 diversion of the public sewer, an S116 of the sewer with new private connections for the channel drain being made into the sewer on behalf of the owners.

5.8 It is our intention to form a new connection to the public sewer from the channel drain. This will require approval from United Utilities in the form of a Section 106 application and will be completed as part of the Stage 5 construction design.

5.9 See *Appendix A* and *Appendix B* depicting the topographic survey and CCTV of the existing surface water run-off within the application site boundary.

5.10 United Utilities who were engaged as part of the consultation process have provided asset mapping detailing the assumed location and levels of their sewers. A copy of surrounding assets and a predevelopment enquiry can be found within Appendix *C*.

## 6. PROPOSED DEVELOPMENT DETAILS

6.1 The proposed development comprises the demolition of the existing buildings and erection of a mixed-use development with retail (Use Class E) at the ground floor and residential development (Use Class C3) and roof terrace above, in addition to car parking, landscaping, and associated infrastructure.

6.2 A copy of the latest proposed site plan has been included within *Appendix D*. The site area has been noted on drawing '*TOPOGRAPHICAL SURVEY PLAN'* as 1466m$^2$, which is shown in *Appendix A.*

6.3 The proposed building makes up the full site extents, the majority of which will consist of a green and blue roof. A car park will be covered by the proposed building which in effect creating an undercroft parking area.

6.4 The green roof located on the southern elevation will provide usable green space

6.5 The application site proposed contributing areas have been calculated and are summarised in Table 2, to be read in conjunction within the proposed contributing area plan included in *Appendix E.*

| Area | m$^2$ | ha |
|---|---|---|
| Application Site Area Total | 1466 | 0.15 |
| Total Proposed contributing areas positively drained within application site | 1466 | 0.15 |
| Percentage Impermeable (PIMP) proposed within application site | 100% | |

*Table 2 - Proposed site areas*

# 7. CONSULTATION AND DATA REVIEW

## Water Authority

7.1 A pre-planning consultation was submitted to the Water Authority, United Utilities, in February 2025 based on the previous site proposals. At the time they confirmed that there is sufficient capacity in the surrounding network for up to 5l/s of flow from site. They have also identified a preferred point of connection, within Fog Lane. The discharge rate for the site is to be confirmed by the LLFA through the planning process, and a brownfield run off calculation will also need to be carried out.

7.2 Infiltration testing has not been carried out on site, however, Geology, the proposed site layout, and proximity to existing structures eliminate the viability of infiltrating SuDS features.

## Lead Local Flood Authority

7.3 The Lead Local Flood Authority (LLFA) has not yet been consulted; however, they will be consulted as part of the planning process. Care has been taken to ensure the drainage strategy proposed is compliant with local and national guidance, standards and policies. The development falls within the Burnage Ward of Manchester, so the LLFA for this development is Manchester City Council.

## Climate Change

7.4 NPPF requires that the projected impacts of climate change are considered over the lifetime of a development. Studies have projected that the Global Sea level will continue to rise and there will be an increase in river flows and rainfall intensity across the country, with the degree of change depending on greenhouse gas emissions and the sensitivity of the climate system.

7.5 In accordance with the current guidance, for a design life of at least 100 years the impacts of the “upper” climate change scenario (90th percentile of potential scenarios) should be considered with respect to rainfall intensity. Within the Upper Mersey Management Catchment, this is predicted to lead to an increase in rainfall intensity of up to 40% in the 1 in 30-year (3.33% annual exceedance probability) rainfall event, and 45% in the 1 in 100-year (1% annual exceedance probability) rainfall event **(Figure 11).**

7.6 As per the requirements of the current national and local guidance, the above allowances will be considered in the design of the surface water drainage systems for the new development. On this basis the capacity of the surface water drainage system would be expected to remain robust over the lifetime of the development and will not lead to an increase in flood risk in the future.

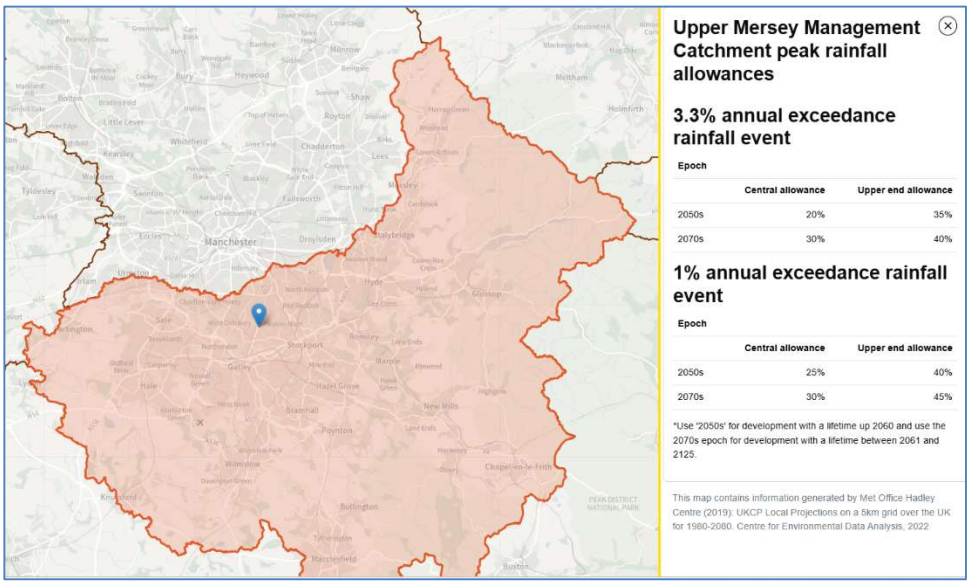



*Figure 11 - Environment Agency Peak Rainfall Allowances*

### Environmental Agency

7.7 The area is noted in flood zone 1 with low probability of flooding. Mapping has highlighted a low to medium risk of shallow surface water flooding likely generated by hard landscaping on site, this can be managed with the on-site surface water drainage strategy.

## 8. EXISTING RUNOFF RATE

### Existing Brownfield Runoff Rate

8.1 An assessment of the existing Brownfield runoff volume has been undertaken using Modified Rational Method within Causeway Flow, and the results are summarised below in **Figure 12**.

Pre-development discharge

| | |
|---|---|
| Site Makeup | Brownfield |
| Brownfield Method | MRM |
| Contributing Area (ha) | 0.098 |
| PIMP (%) | 100 |
| CV | 1.000 |
| Time of Concentration (mins) | 15.00 |
| Betterment (%) | 0 |

Calc

| Return Period (years) | Q (l/s) |
|---|---|
| 2 | 10.5 |
| 30 | 25.9 |
| 100 | 32.9 |

*Figure 12 - Modified Rational Method calculation of Existing Flow Rate*

# 9. PROPOSED RUNOFF DESTINATION

## Proposed Runoff Rate

9.1 In line with local guidance, the proposed run off rate has been calculated using Modified Rational Method for the existing impermeable area on site. The existing peak discharge rate has been calculated to be 32.9l/s. Therefore, a discharge rate of 5l/s has been proposed. When discharge rates are below 5l/s, the risk of blockages is higher, and can pose a maintenance risks. A predevelopment enquiry has been submitted to United Utilities, and they have previously confirmed capacity in the surrounding public network up to a proposed rate of 5l/s. This discharge rate is yet to be agreed with the LLFA and is subject to their approval. The volume of attenuation required on site is subject to change until this rate is confirmed.

## Proposed Attenuation Volume

9.2 A surface water hydraulic model has been developed to inform the planning application and to determine the required attenuation volume. The outputs from this model are presented in Appendix G of this report. Due to site constraints associated with the footprint of the proposed building, the drainage strategy has adopted an above-ground attenuation solution. This is to be achieved through the incorporation of green and blue roof systems. It is currently proposed that a total attenuation volume of 76m³ will be provided, primarily through blue roof storage, located above ground as part of the overall drainage design.

## 10. PROPOSED SURFACE WATER RUNOFF DESTINATION

10.1 According to National Standards for sustainable drainage systems Part II Section A – the following order of preference must be considered in respect of the Surface Water Runoff destination:

- Discharge into the ground,
- Discharge to surface water body,
- Discharge to a surface water sewer, drain,
- Discharge to a combined sewer,

10.2 Subject to complying with these National standards, different destinations may apply for different parts of the site.

10.3 The proposed means of managing surface water runoff from the proposed development has been considered with respect to the hierarchy set out in Building Regulations Part H (2010) as follows.

### Discharge into the ground - infiltration expectations

10.4 Consideration of the proposed means of surface water drainage should firstly be given to infiltration techniques (to ground).

10.5 The ground conditions and bore holes have not yet been carried out to determine exact ground conditions.

10.6 The Phase 1 ground investigation desk study suggests due to expected ground conditions that the site is not suitable for soakaways.

10.7 Based on the nature of the site as brownfield, and the close proximity of existing buildings, it is likely that infiltration is not a viable option. The presence of made ground would also confirm this.

### Discharge to surface water body

10.8 There are no surface water bodies within close proximity to the site. The River Mersey is approximately 1.5km to the south of the site. There are no existing surface water private or public sewers which may convey water towards local surface water bodies, and it is unfeasible to make a direct connection to surrounding surface water bodies

### Discharge to Surface Water Sewer

10.9 As mentioned in Section 4, there are no surface water sewers within the vicinity of the application. The site is surrounded by a combined network on all sides and has not been upgraded into a separate network. A pre-planning consultation was submitted to the Water Authority, United Utilities, in March 2025.

10.10 No connection to existing surface water sewers will be made.

### Discharge to Combined Water Sewer

10.11 As all other points of discharge have been exhausted, it is proposed that a connection to the neighbouring combined sewer is made.

10.12 There is an existing connection from the site westbound to an existing combined water sewer situated within Kingsway, it is proposed this connection is abandoned the proposed layout will place foundations directly above these existing chambers.

10.13 It is proposed that the surface and foul water systems will remain separate until the final point of connection where they will combine with a new manhole built connecting out to the south of the building towards fog lane.

10.14 Surface water discharge rate will be restricted to 5.0l/s using a flow control on the final connection with infiltrating attenuation provided upstream to store water within the site during peak rainfall events.

10.15 A pre-planning enquiry was submitted to United Utilities to confirm acceptance of this approach. They have confirmed capacity in their network up to 5l/s.

10.16 United Utilities have suggested the fog lane connection is the best point of connection, and that the depth to invert in this location is approximately 1.4m BGL.

## 11. SuDS COMPONENTS

11.1 It is policy for all surface water systems for development sites to be designed using SuDS wherever possible.

11.2 Initial assessment of the SuDS techniques is summarised in Table 3 below.

**TABLE: 3. Types of SuDS Components – Ciria SuDS Manual 2015.**

| Component Type | | Description and Proposed Development Suitability |
|---|---|---|
| Rainwater harvesting systems | Description | Rainwater is collected from the roof of a building or from other paved surfaces in an over ground or underground tank for use on site. Depending on its intended use, the system may include treatment elements. The system should include specific storage provision if it is to be used to manage runoff to a design standard. |
| | Suitability | The blue-green roof system lends itself to rainwater harvesting for irrigation of the roof gardens subject to suitability with the proposed landscaping strategy. Roof-level storage maintains gravitational potential energy for distribution and provides additional water quality treatment prior to reuse. |
| Green Roofs/ Blue Roofs | Description | A planted soil layer constructed on the roof of a building to create a living surface. Water is stored in the soil layer and absorbed by the vegetation. Blue roofs store water at roof level, without the use of vegetation. |
| | Suitability | To be used and designed for both attenuation, treatment and biodiversity net gain. |
| Infiltration systems | Description | These systems collect and store runoff allowing it to infiltrate into the ground. Overlaying vegetation and underlaying unsaturated solid can offer protection to ground water from pollution risks. |
| | Suitability | A ground investigation has not yet occurred. If infiltration rates are discovered to be suitable then infiltration systems will be incorporated where feasible. However, there is minimal ground space available due to surrounding foundation easements. |
| Filter Strips | Description | Runoff from impermeable area is allowed to flow across a grassed or otherwise planted area to promote sedimentation and filtration. |
| | Suitability | Not suitable due to the development layout. |
| Filter drains | Description | Runoff is temporarily stored below the surface in a shallow trench filled with stone/gravel, providing attenuation, conveyance and treatment (via filtration). |
| | Suitability | Not suitable due to the development layout. |
| | Description | A vegetation channel is used to convey and treat runoff via shallow naturally landscaped channels that convey and/or infiltrate the runoff (via infiltration). These can be ‘wet’, where water is designed to remain permanently at the base of the swale, or ‘dry’ where water is only present in the channel after rainfall events. It can be lines, or unlined to allow infiltration. |

| | | |
|---|---|---|
| Swales | Suitability | Not suitable due to the development layout. |
| Bioretention systems | Description | A shallow landscaped depression allows runoff to pond temporarily on the surface, before filtering though vegetation and underlying soils prior to collection or infiltration. In its simplest form it is often referred to as a rain garden. Engineered soils (gravel and sand layers) and enhanced vegetation can be used to improve treatment performance. |
| | Suitability | Not suitable due to the development layout. |
| Trees | Description | Trees can be planted within a range of infiltration SuDS components to improve their performance, as root growth and decomposition increase soil infiltration capacity. Alternatively, they can be used as standalone features within soil-filled tree pits, tree planters or structural soils, collection and storing runoff and providing treatment (via infiltration and phytoremediation). |
| | Suitability | Trees can be accommodated within green/blue roof and roof garden systems using engineered substrates, providing rainfall storage, interception and evapotranspiration, with additional water quality benefits through uptake and phytoremediation. |
| Pervious Pavements | Description | Runoff is allowed to soak through structural paving. This can be paving blocks with gaps between solid blocks, or porous paving where water filters though the block itself. Water can be stored in the sub-base and potentially allowed to infiltrate into the ground. |
| | Suitability | Not suitable due to the development layout. |
| Attenuation storage tanks | Description | Below ground voided spaces can be used to temporarily store runoff before infiltration, controlled release or use. The storage structure is often constructed using geocellular or other modular storage systems, concrete tanks or oversized pipes. |
| | Suitability | Storage tanks could be lined with an impermeable geotextile to prevent infiltration however blue and green roofs currently proposed negate the requirement for underground storage. |
| Detention Basin | Description | During a rainfall event, runoff drains to a landscaped depression with an outlet that restricts flows, so that the basin fills and provides attenuation. Generally, basins are dry, except during and immediately following the rainfall events. If vegetated, runoff will be treated as it is conveyed and filtered across the base of the basin. Naturally, vegetated depressions designed to store runoff temporarily. |
| | Suitability | Not suitable due to the development layout. |
| Ponds and wetlands | Description | Features with a permanent pool of water can be used to provide attenuation and treatment of runoff, where outflows are controlled, and water levels are allowed to increase following rainfall. They can support emergent and submerged vegetation along their shoreline and in shallow. Marshy zones, which enhance treatment processes and biodiversity. |
| | Suitability | Not suitable due to the development layout. |

*Table 3 - Types of SuDS Components – Ciria SuDS Manual 2015.*

11.3 It is proposed to specify appropriate SuDS throughout the new development wherever possible, with specific target areas being:

- Source Control SuDS techniques, such as blue green roofs with overflow to next stage of drainage system will be encouraged where possible.
- Site - control - reduction in peak flows to outfall, thereby not increasing flood risk downstream of connection.
- Improvement of water quality arriving at outfall (passive removal of pollutants), thereby reducing potential for pollution downstream of the connection point.

## 12. CLIMATE CHANGE ALLOWANCE

12.1 It is anticipated that climate change will bring an increase in rainfall intensity in the future and therefore an allowance for climate change should be included to help minimise vulnerability and provide resilience to flooding and coastal change in the future. Both the 'central' and 'upper end' allowance should be assessed to understand the range of impact.

12.2 The 'Central' allowance should be applied to the surface water drainage network/design to assess its performance and ability to contain critical events. The 'Upper End' allowance should be applied to assess the potential flood risk implications to the site and to ensure that flooding is wholly contained onsite.

12.3 The Environment Agency Guidance in **Figure 11** shows anticipated changes in extreme rainfall intensity across the country. Over the next 100 years, the increase in extreme rainfall intensity is expected to be between 25-45%.

12.4 With an estimated design life of 100 years for residential developments, any necessary onsite designs for drainage, soakaways or other suitable disposal methods limiting surface water disposal flows will incorporate rainfall intensities that have been increased by 45% to take account of the effects of climate change.

12.5 It is recommended that for the proposed development the drainage is designed to contain (without surface flooding) a 1 to 100-year 6-hour rainfall event with an 'Upper End' allowance included i.e., + 45% CC (Climate Change).

## 13. SURFACE WATER DRAINAGE STRATEGY

13.1 A preliminary drainage strategy has been undertaken to establish principles of the design for foul and surface water drainage for the proposed development.

13.2 All drained areas will be designed to meet the Statutory Requirements as follows:

- Source Control SuDS techniques such as rain gardens planted with broad-leafed shrubs/plants with high rainfall interception and water demand allowing interception of surface water runoff from adjoining surfaces.
- Site control - All SuDS features will be designed for the critical 100-year (1%) rainfall event with an allowance for climate change and therefore there will be no risk of uncontrolled flooding on site for all rainfall events up to 100-year return with 45% climate change.
- All exceedance flows beyond those for which the drainage system is designed will be directed though the site, as such that there will be no risk of flooding of vulnerable or critical areas. Or a worsening of the flow paths offsite.

13.3 Permeable surfaces will be encouraged throughout the development to provide interception, pollution removal, storage at source with an overflow from the roof layer to next element of drainage system.

13.4 All recommendations will be developed further during the detailed design stage.

### Surface Water Network

13.5 All surface water runoff arising from the development (approximate contributing area of 1466m$^2$ (Urban Creep has not been applied as the development makes up the full extent of the application area)) will be intercepted and managed at source using above ground SuDS features. The runoff will then be directed via underground gravity pipes to an existing combined water mahole outfall. The full upstream features are shown on the Proposed Drainage Strategy Plan in *Appendix F*.

13.6 Based on the assessment of the hierarchy of discharge demonstrated in *Section 9*, the proposed site layout and topography, the following SuDS elements have been included within the proposed surface water management on site:

- A blue green roof for biodiversity and storage
- Staged discharge – restricted roof discharge and flow control aiding in attenuation and controlled discharge

13.7 Water will be directed via levels on site towards channel drains. Any rainfall onto the building will be controlled at source and stored within the blue green roof designed by a specialist supplier. The roof will discharge at a controlled rate into the below ground network. An overflow will also be provided discharging to the proposed network in the event of an exceedance event. The flow control device will be restricted to 5.0l/s discharge rate. Connection to the United Utilities network will be made via a proposed connection to an existing combined manhole south of the site, following approval from the Water Authority, United Utilities.

13.8 To accommodate the 1 in 100 years plus 45% climate change event, approximately 76m$^3$ of storage provided by blue roofs would be required across the site. It is proposed that the attenuation will be provided within the roof structure. The individual storage, depths and layout sizes are noted on the Proposed Drainage Strategy Plan in *Appendix F*. There are additional measures such that will provide methods of slowing transfer of water, retaining water and assisting with the upstream treatment.

13.9 Any proposed proprietary systems to be installed in strict accordance with manufacturer's design and instructions. Systems to include maintenance access features / ventilation pipes as required.

## 14. FOUL WATER DRAINAGE STRATEGY

### Foul Water Network

14.1 Foul Water flows associated with the development will be connected below ground by gravity into the proposed combined manhole constructed online of the existing 150dia combined water sewer following approval from United Utilities. See attached Proposed Drainage Strategy plan in *Appendix F*.

14.2 A connection will be made via a S106 application following agreement to the pre-development enquiry submitted by HBL to United Utilities.

14.3 Any proposed private foul drainage will be designed in accordance with Building Regulations Document H1.

## 15. DESIGN FOR EXCEEDANCE

15.1 The drainage system will be designed so that, unless an area is designed to hold/or convey water as part of the design, flooding does not occur on any part of the site for 1 in 100-year rainfall event plus 45% climate change.

15.2 The design has considered flows resulting from rainfall in excess of the 1 in 100-year rainfall event plus 45% climate change and site surfaces will be modelled so that flood flows generated on site from events beyond the stipulated drainage design criteria will be directed away from vulnerable areas and contained on site where possible.

15.3 Following measures may be employed where considered appropriate:

- Slope of all paved areas to direct surface water away from existing and proposed structures,
- Channel drainage incorporated at all thresholds to collect exceedance flows,
- Raised and dropped kerb details to direct flow,
- Clear external falls towards existing exceedance routes.

## 16. WATER QUALITY

16.1 Runoff quality from various land use is classed as Very Low, Low, Medium, and High Hazard depending on its source.

16.2 Pollution hazard from the proposed land use is classed as **Very Low to Low** and simple index approach to deliver part treatment.

**TABLE 4.3 Minimum water quality management requirements for discharges to receiving surface waters and groundwater**

| Land use | Pollution hazard level | Requirements for discharge to surface waters, including coasts and estuaries[2] | Requirements for discharge to groundwater |
|---|---|---|---|
| Residential roofs | Very low | Removal of gross solids and sediments only | |
| Individual property driveways, roofs (excluding residential), residential car parks, low traffic roads (eg cul de sacs, home zones, general access roads), non-residential car parking with infrequent change (eg schools, offices) | Low | Simple index approach[3]<br>*Note: extra measures may be required for discharges to protected resources[1]* | |
| Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways | Medium | Simple index approach[3]<br>*Note: extra measures may be required for discharges to protected resources[1]* | Simple index approach[3]<br>*Note: extra measures may be required for discharges to protected resources[1]*<br>In England and Wales, Risk Screening[4] must be undertaken first to determine whether consultation with the environmental regulator is required.<br>In Northern Ireland, the need for risk screening should be agreed with the environmental regulator. |
| Trunk roads and motorways | High | Follow the guidance and risk assessment process set out in HA (2009) | |
| Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured, industrial sites | High | Discharges may require an environmental licence or permit[3]. Obtain pre-permitting advice from the environmental regulator. Risk assessment is likely to be required[5]. | |

**Notes**

The minimum water quality management requirements for discharges to receiving surface waters and groundwater are presented here. (For Northern Ireland, this guidance should be considered as interim until such time as Northern Ireland publishes its own legislation/policy/guidance.)

1 These are not required in Scotland and Northern Ireland. For England and Wales, see Step 3 of the simple index approach (Section 26.7.1).
Protected surface water resources will include those designated for drinking water abstraction or for other environmental protection reasons. Protected groundwater resources are represented by SPZ1s in England and Wales.

2 In Scotland, the Water Environment (Controlled Activities) (Scotland) Regulations (CAR) 2011 General Binding Rules, Rule 10 (d) (iv) effectively provides an exemption from requiring SuDS for coastal discharges. However, control of any contaminants likely to be present in surface water runoff is still required, but can be delivered using alternative methods such as proprietary treatment products. As the term 'SuDS' in this manual includes proprietary treatment products, this exemption is not valid in this context.

3 The application of the simple index approach should follow the approach outlined in Section 26.7.1 (or equivalent approved).

4 Risk screening is an assessment to identify high risk scenarios where the Environment Agency or Natural Resources Wales (NRW) would wish to be consulted regarding infiltration of water from surface runoff in order to agree the proposed design approach. The risk screening method is provided in Section 26.7.2.

5 The risk assessment should determine the appropriate design approach to mitigate risk to acceptable levels following the guidance outlined in Section 26.7.3. This assessment should be approved by the environmental regulator.

*Figure 13 - Minimum water quality management requirements for discharge to receiving surface waters and groundwater – Extract from Ciria SuDS Manual 2015 (Table 4.3)*

**TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters**

| | Mitigation indices[1] | | |
|---|---|---|---|
| **Type of SuDS component** | **TSS** | **Metals** | **Hydrocarbons** |
| Filter strip | 0.4 | 0.4 | 0.5 |
| Filter drain | 0.4[2] | 0.4 | 0.4 |
| Swale | 0.5 | 0.6 | 0.6 |
| Bioretention system | 0.8 | 0.8 | 0.8 |
| Permeable pavement | 0.7 | 0.6 | 0.7 |
| Detention basin | 0.5 | 0.5 | 0.6 |
| Pond[4] | 0.7[3] | 0.7 | 0.5 |
| Wetland | 0.8[3] | 0.8 | 0.8 |
| Proprietary treatment systems[5,6] | These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area. | | |

**Notes**

1 SuDS components only deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters.

2 Filter drains can remove coarse sediments, but their use for this purpose will have significant implications with respect to maintenance requirements, and this should be taken into account in the design and Maintenance Plan.

3 Ponds and wetlands can remove coarse sediments, but their use for this purpose will have significant implications with respect to the maintenance requirements and amenity value of the system. Sediment should normally be removed upstream, unless they are specifically designed to retain sediment in a separate part of the component, where it cannot easily migrate to the main body of water.

4 Where a wetland is not specifically designed to provide significantly enhanced treatment, it should be considered as having the same mitigation indices as a pond.

5 See Chapter 14 for approaches to demonstrate product performance. A British Water/Environment Agency assessment code of practice is currently under development that will allow manufacturers to complete an agreed test protocol for systems intended to treat contaminated surface water runoff. Full details can be found at: **http://tinyurl.com/qf7yuj7**

6 SEPA only considers proprietary treatment systems as appropriate in exceptional circumstances where other types of SuDS component are not practicable. Proprietary treatment systems may also be considered appropriate for existing sites that are causing pollution where there is a requirement to retrofit treatment. SEPA (2014) also provides a flowchart with a summary of checks on suitability of a proprietary system.

*Figure 14 - Indicative SuDS mitigation indices for discharge to surface water - Table 26.3 CIRIA*

**TABLE 26.2 Pollution hazard indices for different land use classifications**

| Land use | Pollution hazard level | Total suspended solids (TSS) | Metals | Hydro-carbons |
|---|---|---|---|---|
| Residential roofs | Very low | 0.2 | 0.2 | 0.05 |
| Other roofs (typically commercial/ industrial roofs) | Low | 0.3 | 0.2 (up to 0.8 where there is potential for metals to leach from the roof) | 0.05 |
| Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day | Low | 0.5 | 0.4 | 0.4 |

*Figure 14 - Minimum water quality management requirements for discharge to receiving surface waters and groundwater – Extract from Ciria SuDS Manual 2015 Table 26.2*

16.3 Bespoke products are proposed to be incorporated as part of the drainage network, to provide a suitable system configuration to accommodate the required on-site storage to attenuate the calculated runoff and manage the treatment train to provide appropriate pollution mitigation.

## The Proposed SuDS Components -

16.4 Pollution Mitigation Indices for Permeable Paving

- Pollution Mitigation Index - Suspended Solids TSS = 0.7
- Pollution Mitigation Index - Metals = 0.6
- Pollution Mitigation Index - Hydrocarbons = 0.7

16.5 Following assessment of the pollution indices for the development (**Low**) Hazard and the pollution mitigation indices for the proposed SuDS Components, it is considered that the total mitigation level of proposed SuDS components will be effective.

16.6 Water runoff from cars into the covered carparking spaces are at risk of having intermittently higher concentration hydrocarbons, therefore the design will include foul connections in this area to prevent this entering the surface water network.

16.7 Additional Silt trap units or silt filters can be specified for surface water inspection chambers throughout the system to minimize silt accumulation in the proposed drainage network. These will be easily accessible for regular jetting.

16.8 Channel drains can also be specified with silt sump units.

## 17. EXECUTIVE SUMMARY

17.1 The site development lies within Flood Zone 1 and is less than 1 Ha. In size, therefore there is no requirement for a Flood Risk Assessment report.

17.2 Sources of flooding have been assessed as part of the Drainage Strategy for the proposed development in its current context.

17.3 A surface water drainage strategy has been prepared for the site providing interception, attenuation, and controlled disposal for all rainfall events up to and including the 100-year critical rainfall event with an increase of 45% to allow for increases in rainfall intensities due to climate change.

17.4 All surface water runoff arising from the development (approximate contributing area of 1466m$^2$) will be intercepted and managed at source. The runoff will be directed via underground gravity pipes to SuDS features across the site. The full upstream features are shown on the Proposed Drainage Strategy Plan in *Appendix F*.

17.5 Discharge from the site will be via a vortex flow control (Hydrobrake or similar approved) limiting the discharge rate to 5.0 l/s following approval from the Lead Local Flood Authority which will attenuate all rainfall events up to 100yr+45%CC.

17.6 Connection will be made via a proposed combined manhole and sewer built to connect into the existing combined sewer to the south of the site, following approval from the Water Authority, United Utilities through a formal Section 106 application.

17.7 Silt chambers can be installed upstream of the attenuation tanks to prevent siltation of attenuation structures and downstream network. All channel drains and gullies will be installed with built-in sump units.

17.8 Drainage design considers flows resulting from rainfall in excess of the 1 in 100-year rainfall event plus 45% climate change. Where possible site surfaces should be modelled so that flood flows generated on site from events beyond the stipulated drainage design criteria will flow away from buildings and other sensitive areas and will be contained on site as reasonably practicable.

17.9 Foul Water flows associated with the development will be connected below ground by gravity into the proposed combined manhole and connect into a public sewer south of the site, following approval from United Utilities through a formal Section 106 application. See attached Proposed Drainage Strategy plan in *Appendix F*.

17.10 Any proposed on-site drainage will be designed and constructed in accordance with current best practice, Lead Local Flood Authority requirements and Building Regulations as appropriate.

17.11 All SuDS on site will be installed with full consideration for long term maintenance. A Drainage Maintenance Schedule should be provided and adhered to.

17.12 Based on the evidence presented, the proposed development is considered acceptable from both a flood risk and drainage perspective. The surface water and foul drainage strategies have been developed in accordance with best practice and relevant guidance, and demonstrate that the site can be appropriately drained without increasing flood risk on or off site.

## APPENDICES

## APPENDIX A – TOPOGRAPHICAL SURVEY PLAN




## Floor Plan Legend:

- Window Cill & Head Height (SHt 1.00m, HHt 2.00m) — SHt: Sill Height From FFL; HHt: Head Height From FFL
- Door Height From FFL (Ht 2.00)
- Overhead Detail
- Stairs/Step
- Radiator (RAD)
- Ventilation / Overhead
- Access Hatch (Hatch)
- TV Point
- Phone Point
- 13A Power Socket
- Fused Socket
- Shaver Socket
- Extractor Fan
- Lantern Light
- Down Light
- Light Dimmer Switch
- Light Switch
- Fixed Lighting
- Fire Alarm Button (FA)
- Fire Extinguisher (FX)
- Reception — Room Name
- Carpet — Floor Covering
- 2.49 — Ceiling Height
- IFL 145.80 — Internal Floor Level

## Topographic Legend:

- Buildings / Walls
- Building Canopy / Overhang
- Concrete edge
- Kerb line
- Centre Line
- Barrier
- Hedge
- Security Fence
- Panel Fence
- Gate
- Overhead Line
- Tree / Sapling (SAP)
- Tree Canopy Line
- Chambers
- CS1 — Survey Station & Name
- BM 100.00 — Bench Mark
- TBM 100.00 — Temporary Bench Mark
- CL — Cover level
- IL — Invert level
- Inv Ø 0.25 — Pipe invert (diameter)
- GU — Gully
- MH — Manhole
- IC — Inspection chamber

| | | | |
|---|---|---|---|
| Trig | Trig Pillar | FS | Flag Staff |
| Ridg | Ridge Level | Mrk | Gas Marker |
| Eave | Eave Level | EP | Electric Post |
| DPC | Dpc Level | TP | Telegraph Post |
| FL | Floor Level | invt | Pipe Invert |
| Soff | Soffit Level | GU | Gully |
| TrBo | Control Box | RP | Rodding Point |
| LP | Lamp Post | BT | Bt Cover |
| SP | Sign Post | CO | Cover Unknown |
| Post | Post | EC | Electricity Cover |
| WM | Water Meter | TL | Traffic Light |
| BB | Bellisha Beacon | FH | Fire Hydrant |
| BOL | Bollard | GAS | Gas Cover |
| BS | Bus Stop | SV | Stop Valve |
| ER | Earthing Rod | TV | Tv Cover |
| Box | Post Box | GV | Gas Valve |
| MS | Mile Stone | Peg | Peg |


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**LONDON**
54 POLAND STREET
SOHO,
LONDON,
W1F 7NJ
020 3728 2884


SITE DETAILS:
TITLE: 2A Lane End Rd
Manchester, M19 1WA

TITLE: Topographical

DRAWING NO.: 23624-23-01

REV: -

SCALE: 1: 200

DATE: 25/10/2023

DRAWN: SH

CHECKED:

LEVEL DATUM: OSGB36(15)

Comments:
This plan should only be used for its original purpose. Castle Surveys Ltd dos not accept any responsibility for this plan if supplied to any other party, other than the original client.
All dimensions and levels should be check on site prior to design and construction.
Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only. Some services may have been omitted due to parked vehicles or due to the site being overgrown with vegetation.
Tree information (where applicable) has been surveyed from ground level and therefore should be treated as approximate only. Advise that a tree survey should be carried out.
Roof linework (where applicable) is indicative only.

DO NOT SCALE

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## APPENDIX B – CCTV SURVEY

LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING

SURVEY SOLUTIONS
0845 040 5969
survey-solutions.co.uk

IPSWICH BRENTWOOD COVENTRY GLASGOW NORWICH NOTTINGHAM YEOVIL

# CCTV Report



## Project

Lane End Road

Burnage, M19 1WA

## Survey Date

26/03/2025

## Client

HBI Associates Ltd

## Surveyor

OB

## Checked By

BC

## Job Number

76187CCTV-01

## Revision

## Issue Date

27/03/2025

chartered ices
QMS ISO 9001 : 2008 REGISTERED
THE SURVEY ASSOCIATION FULL MEMBER
RICS®

# High Pressure Jetting & Resurvey

## Maintenance Visits

Following the initial investigations completed on site we would recommend a quarterly re-survey of the drainage network inorder to monitor the ongoing pipework condition.

## System Maintenance Survey:

Quarterly Assessment of Existing Defects Due – 26/06/2025
Annual Full System Re-survey Due – 26/03/2026

## High Pressure Jetting Required:

Defect Percentage:

(5% - 30%) – MH1 A, MH1 B,

(35 % - 60%) -

(65% - 95%) – MH2 B

SURVEY SOLUTIONS

*Survey solutions*
Wilmslow
Cheshire
Tel: 01625 533444, Fax:

# Project-information

| Project name: | Contract number: | Contact: | Date: |
|---|---|---|---|
| **Lane End Road** | **76187** | **Alfie Cooper** | **27/03/2025** |

| | |
|---|---|
| Client | **HBI Associates Ltd** |
| Contact: | **Alfie Cooper** |
| Position: | **Senior Engineer** |
| Road | **Craig house, 33 Ballbrook Avenue** |
| Town | **Didsbury** |
| County | **Manchester** |
| Telephone: | **0161 432 9977** |
| Fax: | |

[redacted]

| | |
|---|---|
| Site | **Lane End Road** |
| Contact: | **Alfie Cooper** |
| Position: | **Senior Engineer** |
| Road | **Lane End Road** |
| Town | **Burnage** |
| County | **Manchester** |
| Telephone: | **0161 432 9977** |
| Fax: | |

[redacted]

| | |
|---|---|
| Contractor | **Survey solutions** |
| Contact: | **Oscar buckley** |
| Position: | **Surveyor** |
| Road | **Units 8-9 Millbank House** |
| Town | **Wilmslow** |
| County | **Cheshire** |
| Telephone: | **01625 533444** |
| Fax: | |
| Mobile: | |
| E-Mail: | [redacted] |

SURVEY SOLUTIONS

*Survey solutions*
Wilmslow
Cheshire
Tel: 01625 533444, Fax:

# Inspection report

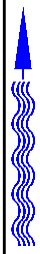
| Date: | Job N°: | Weather: | Operator: | section number: | PLR: |
|---|---|---|---|---|---|
| **27/03/2025** | **76187** | **Dry** | **OB** | **1** | **X** |
| Present: | Vehicle: | Camera: **SOLOPRO+** | Preset: | Cleaned: **No** | Grade: |

| | | | | | |
|---|---|---|---|---|---|
| Road: | **Land End Road** | Division: | | start MH: | **MH1 A** |
| Place: | **Land End Road** | District: | | end MH: | |
| Location: | | Tape No.: | | Total length: | **9.95 m** |

| | | | |
|---|---|---|---|
| Purpose: | **Structural defects** | Shape/Size: | **Circular dia 150 mm** |
| Use: | **Combined** | Material: | **Vitrified clay** Pipe length: |
| Catchment: | | Lining: | |
| | | Category: | |

Comment:

Location details:



| 1:75 position | | code | observation | counter | photo | grade |
|---|---|---|---|---|---|---|
| 0.00 | | MH | Manhole Remark: MH1 A | 00:00:00 | | (Constr) 0 |
| 0.00 | | ST | Start of Survey | 00:00:00 | | (Misc) 0 |
| 0.00 | | WL | Water level, 0 % height/diameter | 00:00:00 | | (Serv) 0 |
| 0.00 | | DES | Debris silt, 5 % cross-sectional area loss | 00:00:00 | 4_4a | (Serv) 1 |
| 8.87 | **S1** | DES | Debris silt, 10 % cross-sectional area loss, Start | 00:00:00 | 5_5a | (Serv) 1 |
| 9.00 | | GP | General Condition photograph | 00:00:00 | 6_6a | (Misc) 0 |
| 9.95 | **F1** | DES | Debris silt, 10 % cross-sectional area loss, Finish | 00:00:00 | 7_7a | (Serv) 1 |
| 9.95 | | SA | Survey abandoned, Remark: Unable to survey beyond this point due to debris. | 00:00:00 | | (Misc) 0 |

| | |
|---|---|
| **Structural Defects** | **Constructional Features** |
| **Service Defects** | **Miscellaneous Features** |

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Cheshire
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# Inspection photos

| Place: | Road: | Date: | section number: | PLR: |
|---|---|---|---|---|
| **Land End Road** | **Land End Road** | **27/03/2025** | **1** | **X** |

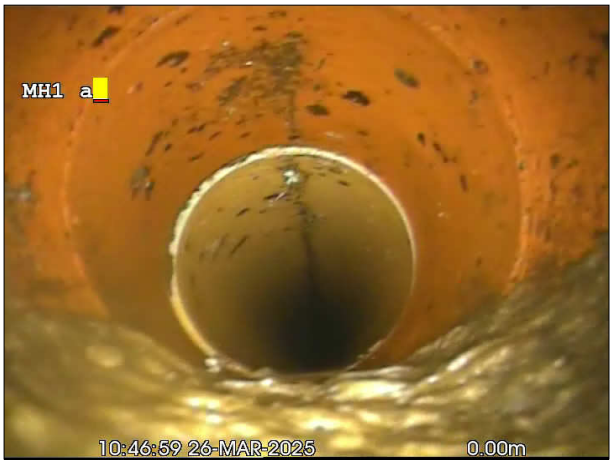



Photo: 4_4a, 00:00:00
0m, Debris silt, 5 % cross-sectional area loss




Photo: 5_5a, 00:00:00
8.87m, Debris silt, 10 % cross-sectional area loss, Start




Photo: 6_6a, 00:00:00
9m, General Condition photograph




Photo: 7_7a, 00:00:00
9.95m, Debris silt, 10 % cross-sectional area loss, Finish

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Cheshire
Tel: 01625 533444, Fax:

# Inspection report

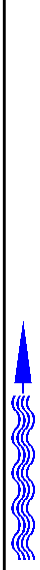
| Date: | Job N°: | Weather: | Operator: | section number: | PLR: |
|---|---|---|---|---|---|
| **27/03/2025** | **76187** | **Dry** | **OB** | **2** | **X** |
| Present: | Vehicle: | Camera: **SOLOPRO+** | Preset: | Cleaned: **No** | Grade: |

| | | | | | |
|---|---|---|---|---|---|
| Road: | **Land End Road** | Division: | | start MH: | **MH1 B** |
| Place: | **Land End Road** | District: | | end MH: | |
| Location: | | Tape No.: | | Total length: | **14.17 m** |

| | | | |
|---|---|---|---|
| Purpose: | **Structural defects** | Shape/Size: | **Circular dia 100 mm** |
| Use: | **Combined** | Material: | **Vitrified clay** Pipe length: |
| Catchment: | | Lining: | |
| | | Category: | |

Comment:

Location details:



| 1:125 position | | code | observation | counter | photo | grade |
|---|---|---|---|---|---|---|
| 0.00 | | MH | Manhole Remark: MH1 B | 00:00:00 | | (Constr) 0 |
| 0.00 | | ST | Start of Survey | 00:00:00 | | (Misc) 0 |
| 0.00 | | WL | Water level, 0 % height/diameter | 00:00:00 | | (Serv) 0 |
| 0.00 | **S1** | DES | Debris silt, 5 % cross-sectional area loss, Start | 00:00:00 | 12_4a | (Serv) 1 |
| 4.96 | | JN | Junction at 01 o´clock, dia 100 mm | 00:00:00 | 13_5a | (Constr) 0 |
| 8.00 | | GP | General Condition photograph | 00:00:00 | 14_6a | (Misc) 0 |
| 14.16 | **F1** | DES | Debris silt, 5 % cross-sectional area loss, Finish | 00:00:00 | | (Serv) 1 |
| 14.17 | | JN | Junction at 10 o´clock, dia 100 mm | 00:00:00 | 2_8a | (Constr) 0 |
| 14.17 | | SA | Survey abandoned, Remark: Unable to survey beyond this point due to restricted leverage. | 00:00:00 | | (Misc) 0 |

| | |
|---|---|
| **Structural Defects** | **Constructional Features** |
| **Service Defects** | **Miscellaneous Features** |

SURVEY SOLUTIONS

*Survey solutions*
Wilmslow
Cheshire
Tel: 01625 533444, Fax:

# Inspection photos

| Place: | Road: | Date: | section number: | PLR: |
|---|---|---|---|---|
| **Land End Road** | **Land End Road** | **27/03/2025** | **2** | **X** |




Photo: 12_4a, 00:00:00
0m, Debris silt, 5 % cross-sectional area loss, Start




Photo: 13_5a, 00:00:00
4.96m, Junction at 01 o´clock, dia 100 mm




Photo: 14_6a, 00:00:00
8m, General Condition photograph




Photo: 2_8a, 00:00:00
14.17m, Junction at 10 o´clock, dia 100 mm

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# Inspection report

| Date: | Job N°: | Weather: | Operator: | section number: | PLR: |
|---|---|---|---|---|---|
| **27/03/2025** | **76187** | **Dry** | **OB** | **3** | **X** |
| Present: | Vehicle: | Camera: **SOLOPRO+** | Preset: | Cleaned: **No** | Grade: |

| | | | | | |
|---|---|---|---|---|---|
| Road: | **Land End Road** | Division: | | start MH: | **MH1 C** |
| Place: | **Land End Road** | District: | | end MH: | |
| Location: | | Tape No.: | | Total length: | **3.81 m** |

| | | | |
|---|---|---|---|
| Purpose: | **Structural defects** | Shape/Size: | **Circular dia 100 mm** |
| Use: | **Combined** | Material: | **Vitrified clay** Pipe length: |
| Catchment: | | Lining: | |
| | | Category: | |

Comment:

Location details:



| 1:50 position | code | observation | counter | photo | grade |
|---|---|---|---|---|---|
| MH1 C 0.00 | MH | Manhole Remark: MH1 C | 00:00:00 | | (Constr) 0 |
| 0.00 | ST | Start of Survey | 00:00:00 | | (Misc) 0 |
| 0.00 | WL | Water level, 0 % height/diameter | 00:00:00 | | (Serv) 0 |
| 2.74 | GP | General Condition photograph | 00:00:00 | 21_4a | (Misc) 0 |
| 3.31 | JN | Junction at 02 o´clock, dia 100 mm | 00:00:00 | 22_5a | (Constr) 0 |
| 3.81 | LU | Line of Sewer deviates up | 00:00:00 | | (Serv) 0 |
| 3.81 | FH | Finish Survey, Remark: Rest bend reached. | 00:00:00 | | (Misc) 0 |

| | |
|---|---|
| **Structural Defects** | **Constructional Features** |
| **Service Defects** | **Miscellaneous Features** |

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# Inspection photos

| Place: | Road: | Date: | section number: | PLR: |
|---|---|---|---|---|
| **Land End Road** | **Land End Road** | **27/03/2025** | **3** | **X** |




Photo: 21_4a, 00:00:00
2.74m, General Condition photograph

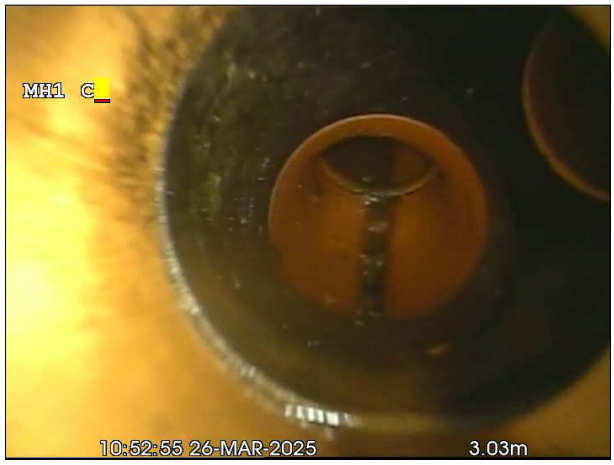



Photo: 22_5a, 00:00:00
3.31m, Junction at 02 o´clock, dia 100 mm

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Cheshire
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# Inspection report

| Date: | Job N°: | Weather: | Operator: | section number: | PLR: |
|---|---|---|---|---|---|
| **27/03/2025** | **76187** | **Dry** | **OB** | **4** | **X** |
| Present: | Vehicle: | Camera: **SOLOPRO+** | Preset: | Cleaned: **No** | Grade: |

| | | | | | |
|---|---|---|---|---|---|
| Road: | **Land End Road** | Division: | | start MH: | **MH1 D** |
| Place: | **Land End Road** | District: | | end MH: | |
| Location: | | Tape No.: | | Total length: | **5.09 m** |

| | | | |
|---|---|---|---|
| Purpose: | **Structural defects** | Shape/Size: | **Circular dia 100 mm** |
| Use: | **Combined** | Material: | **Vitrified clay** Pipe length: |
| Catchment: | | Lining: | |
| | | Category: | |

Comment:

Location details:

| 1:50 | position | code | observation | counter | photo | grade |
|---|---|---|---|---|---|---|
| MH1 D | 0.00 | MH | Manhole Remark: MH1 D | 00:00:00 | | (Constr) 0 |
| | 0.00 | ST | Start of Survey | 00:00:00 | | (Misc) 0 |
| | 0.00 | WL | Water level, 0 % height/diameter | 00:00:00 | | (Serv) 0 |
| | 2.20 | GP | General Condition photograph | 00:00:00 | 28_4a | (Misc) 0 |
| | 5.09 | LU | Line of Sewer deviates up | 00:00:00 | | (Serv) 0 |
| | 5.09 | FH | Finish Survey, Remark: Rest bend reached | 00:00:00 | | (Misc) 0 |

| | |
|---|---|
| **Structural Defects** | **Constructional Features** |
| **Service Defects** | **Miscellaneous Features** |

SURVEY SOLUTIONS

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# Inspection photos

| Place: | Road: | Date: | section number: | PLR: |
|---|---|---|---|---|
| **Land End Road** | **Land End Road** | **27/03/2025** | **4** | **X** |

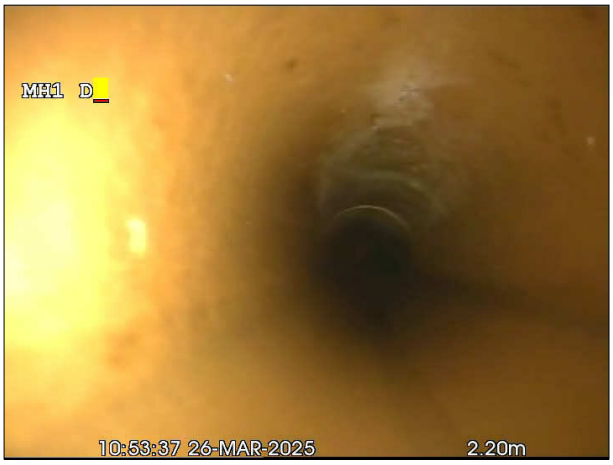



Photo: 28_4a, 00:00:00
2.2m, General Condition photograph

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Cheshire
Tel: 01625 533444, Fax:

# Inspection report

| Date: | Job N°: | Weather: | Operator: | section number: | PLR: |
|---|---|---|---|---|---|
| **27/03/2025** | **76187** | **Dry** | **OB** | **5** | **MH1 X X** |
| Present: | Vehicle: | Camera: **SOLOPRO+** | Preset: | Cleaned: **No** | Grade: |

| | | | | | |
|---|---|---|---|---|---|
| Road: | **Land End Road** | Division: | | start MH: | **MH1 X** |
| Place: | **Land End Road** | District: | | end MH: | **MH2** |
| Location: | | Tape No.: | | Total length: | **12.51 m** |

| | | | |
|---|---|---|---|
| Purpose: | **Structural defects** | Shape/Size: | **Circular dia 150 mm** |
| Use: | **Combined** | Material: | **Vitrified clay** Pipe length: |
| Catchment: | | Lining: | |
| | | Category: | |

Comment:

Location details:



| 1:100 position | code | observation | counter | photo | grade |
|---|---|---|---|---|---|
| MH1 X 0.00 | MH | Manhole Remark: MH1 X | 00:00:00 | | (Constr) 0 |
| 0.00 | ST | Start of Survey | 00:00:00 | | (Misc) 0 |
| 0.00 | WL | Water level, 0 % height/diameter | 00:00:00 | | (Serv) 0 |
| 6.00 | GP | General Condition photograph | 00:00:00 | 34_4a | (Misc) 0 |
| 9.86 | WL | Water level, 20 % height/diameter | 00:00:00 | | (Serv) 0 |
| 9.87 **S1** | CU | Camera Underwater, Start, Remark: Loss of vision | 00:00:00 | | (Misc) 0 |
| 9.89 | WL | Water level, 20 % height/diameter | 00:00:00 | | (Serv) 0 |
| MH2 12.51 **F1** | CU | Camera Underwater, Finish, Remark: Loss of vision | 00:00:00 | | (Misc) 0 |
| 12.51 | FH | Finish Survey, Remark: MH2 reached | 00:00:00 | 38_9a | (Misc) 0 |

| | |
|---|---|
| **Structural Defects** | **Constructional Features** |
| **Service Defects** | **Miscellaneous Features** |

SURVEY SOLUTIONS

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Cheshire
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# Inspection photos

| Place: | Road: | Date: | section number: | PLR: |
|---|---|---|---|---|
| **Land End Road** | **Land End Road** | **27/03/2025** | **5** | **MH1 X X** |




Photo: 34_4a, 00:00:00
6m, General Condition photograph




Photo: 38_9a, 00:00:00
12.51m, Finish Survey, Remark: MH2 reached

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# Inspection report

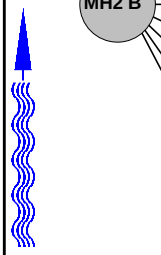
| Date: | Job N°: | Weather: | Operator: | section number: | PLR: |
|---|---|---|---|---|---|
| **27/03/2025** | **76187** | **Dry** | **OB** | **6** | **X** |
| Present: | Vehicle: | Camera: **SOLOPRO+** | Preset: | Cleaned: **No** | Grade: |

| | | | | | |
|---|---|---|---|---|---|
| Road: | **Land End Road** | Division: | | start MH: | **MH2 B** |
| Place: | **Land End Road** | District: | | end MH: | |
| Location: | | Tape No.: | | Total length: | **0 m** |

| | | | |
|---|---|---|---|
| Purpose: | **Structural defects** | Shape/Size: | **Circular dia 100 mm** |
| Use: | **Combined** | Material: | **Vitrified clay** Pipe length: |
| Catchment: | | Lining: | |
| | | Category: | |

Comment:

Location details:




| 1:25 | position | code | observation | counter | photo | grade |
|---|---|---|---|---|---|---|
| | 0.00 | MH | Manhole Remark: MH2 B | 00:00:00 | | (Constr) 0 |
| | 0.00 | ST | Start of Survey | 00:00:00 | | (Misc) 0 |
| | 0.00 | WL | Water level, 0 % height/diameter | 00:00:00 | | (Serv) 0 |
| | 0.00 | DES | Debris silt, 80 % cross-sectional area loss | 00:00:00 | 42_4a | (Serv) 1 |
| | 0.00 | SA | Survey abandoned, Remark: Unable to survey beyond this point due to blockage. | 00:00:00 | | (Misc) 0 |

| | |
|---|---|
| **Structural Defects** | **Constructional Features** |
| **Service Defects** | **Miscellaneous Features** |

SURVEY SOLUTIONS

*Survey solutions*
Wilmslow
Cheshire
Tel: 01625 533444, Fax:

# Inspection photos

| Place: | Road: | Date: | section number: | PLR: |
|---|---|---|---|---|
| **Land End Road** | **Land End Road** | **27/03/2025** | **6** | **X** |




Photo: 42_4a, 00:00:00
0m, Debris silt, 80 % cross-sectional area loss

## PAS 128: 2014 QUALITY LEVEL GUIDE

| Q-LEVEL | DESCRIPTION | ACC. | Q-LEVEL | DESCRIPTION |
|---|---|---|---|---|
| QL-D | Service positions taken from records. | Undefined | QL-B2 | Horizontal & vertical location using only one geophysical technique. |
| QL-C | Visual evidence of service existence but undetectable by geophysical technology. | Undefined | QL-B1 | Horizontal & vertical location using multiple geophysical techniques. |
| QL-B4 | Undetectable service present shown as an assumed route. (AR) | +/- 500mm D.Not. | QL-A | Horizontal & vertical position verification by open excavation, manholes and/or inspection chambers. |
| QL-B3 | Horizontal location by one geophysical technique but with none or poor depth information. | | | |

## DETECTION METHOD
IN ACCORDANCE WITH PAS 128: 2014 SURVEY TYPE B

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VP's, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms
BT cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductible non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes
GM/GS and/or WM/WS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
When the Gas/Water pipe work is constructed using conductible materials, then we are able to to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductible material is used, GPR methodology will be employed to locate and plot the final service layout.

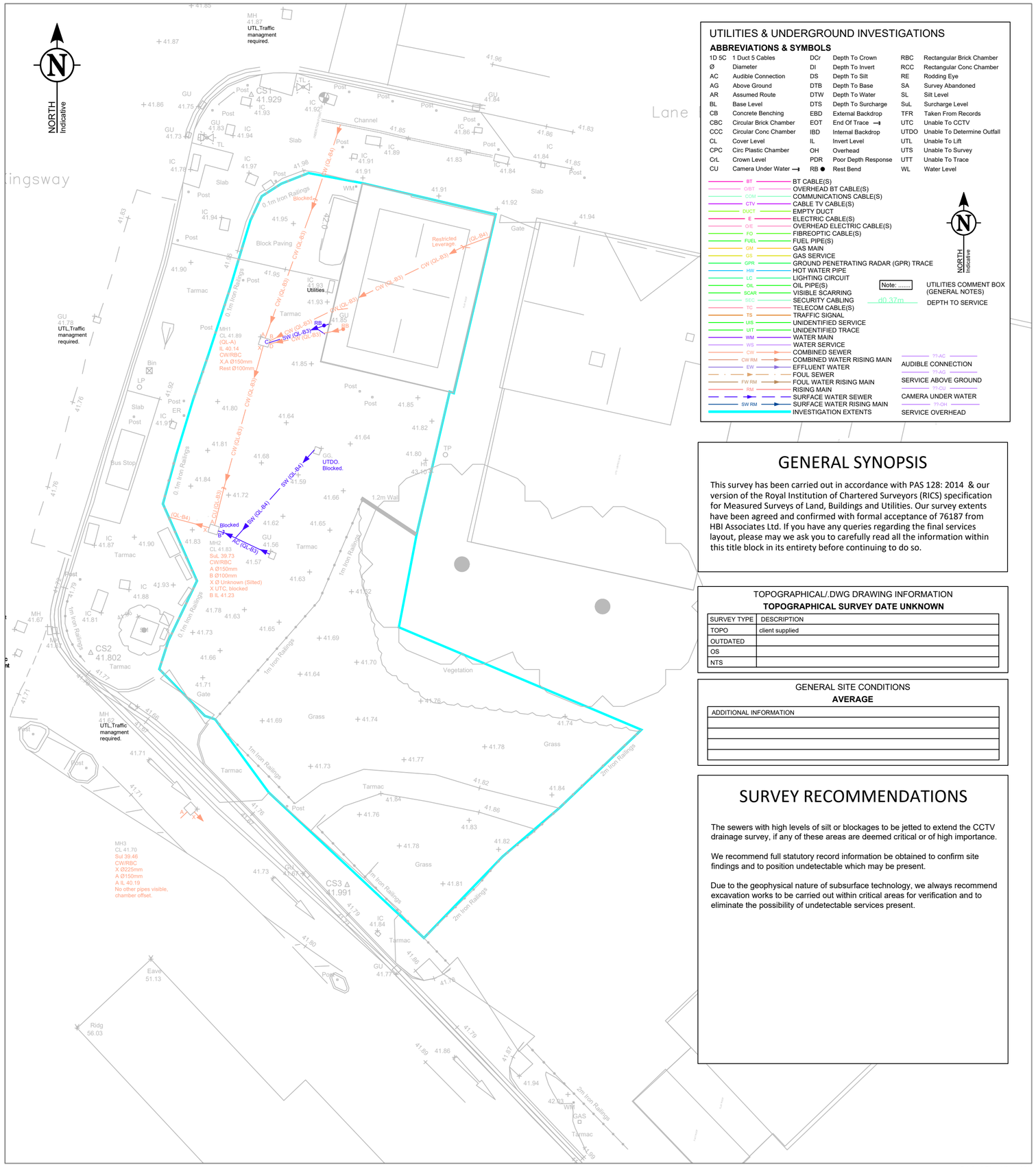
Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductible piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm,C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITs will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (QL-B4/D)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/ics/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.




## UTILITIES & UNDERGROUND INVESTIGATIONS

**ABBREVIATIONS & SYMBOLS**

| | | | | | |
|---|---|---|---|---|---|
| 1D 5C | 1 Duct 5 Cables | DCr | Depth To Crown | RBC | Rectangular Brick Chamber |
| Ø | Diameter | DI | Depth To Invert | RCC | Rectangular Conc Chamber |
| AC | Audible Connection | DS | Depth To Silt | RE | Rodding Eye |
| AG | Above Ground | DTB | Depth To Base | SA | Survey Abandoned |
| AR | Assumed Route | DTW | Depth To Water | SL | Silt Level |
| BL | Base Level | DTS | Depth To Surcharge | SuL | Surcharge Level |
| CB | Concrete Benching | EBD | External Backdrop | TFR | Taken From Records |
| CBC | Circular Brick Chamber | EOT | End Of Trace ⟞ | UTC | Unable To CCTV |
| CCC | Circular Conc Chamber | IBD | Internal Backdrop | UTDO | Unable To Determine Outfall |
| CL | Cover Level | IL | Invert Level | UTL | Unable To Lift |
| CPC | Circ Plastic Chamber | OH | Overhead | UTS | Unable To Survey |
| CrL | Crown Level | PDR | Poor Depth Response | UTT | Unable To Trace |
| CU | Camera Under Water ⟞ | RB ● | Rest Bend | WL | Water Level |

| | |
|---|---|
| BT | BT CABLE(S) |
| OHBT | OVERHEAD BT CABLE(S) |
| COM | COMMUNICATIONS CABLE(S) |
| CTV | CABLE TV CABLE(S) |
| DUCT | EMPTY DUCT |
| E | ELECTRIC CABLE(S) |
| OHE | OVERHEAD ELECTRIC CABLE(S) |
| FO | FIBREOPTIC CABLE(S) |
| FUEL | FUEL PIPE(S) |
| GM | GAS MAIN |
| GS | GAS SERVICE |
| GPR | GROUND PENETRATING RADAR (GPR) TRACE |
| HW | HOT WATER PIPE |
| LC | LIGHTING CIRCUIT |
| OIL | OIL PIPE(S) |
| SCAR | VISIBLE SCARRING |
| SEC | SECURITY CABLING |
| TC | TELECOM CABLE(S) |
| TS | TRAFFIC SIGNAL |
| UIS | UNIDENTIFIED SERVICE |
| UIT | UNIDENTIFIED TRACE |
| WM | WATER MAIN |
| WS | WATER SERVICE |
| CW | COMBINED SEWER |
| CW RM | COMBINED WATER RISING MAIN |
| EW | EFFLUENT WATER |
| FOUL | FOUL SEWER |
| FW RM | FOUL WATER RISING MAIN |
| RM | RISING MAIN |
| SW | SURFACE WATER SEWER |
| SW RM | SURFACE WATER RISING MAIN |
| INV | INVESTIGATION EXTENTS |

Note: .....
d0.37m
UTILITIES COMMENT BOX (GENERAL NOTES)
DEPTH TO SERVICE

?? AC — AUDIBLE CONNECTION
?? AG — SERVICE ABOVE GROUND
?? CU — CAMERA UNDER WATER
?? OH — SERVICE OVERHEAD

NORTH Indicative

## GENERAL SYNOPSIS

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 76187 from HBI Associates Ltd. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL/.DWG DRAWING INFORMATION
**TOPOGRAPHICAL SURVEY DATE UNKNOWN**

| SURVEY TYPE | DESCRIPTION |
|---|---|
| TOPO | client supplied |
| OUTDATED | |
| OS | |
| NTS | |

GENERAL SITE CONDITIONS
**AVERAGE**

| ADDITIONAL INFORMATION |
|---|
| |
| |
| |
| |

## SURVEY RECOMMENDATIONS

The sewers with high levels of silt or blockages to be jetted to extend the CCTV drainage survey, if any of these areas are deemed critical or of high importance.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

## UTILITIES & UNDERGROUND INVESTIGATIONS

**DRAWING NOTES**

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out to confirm any identifications, positions and depths.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to inverts, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

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This drawing should only be scaled using digital methods.

**DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)**
**PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B**
**COMMISSIONED: NO**

| UTILITY | AVAILABILITY | UTILITY COMPANY PROVIDER |
|---|---|---|
| SEWER | NO | N/A |
| WATER MAIN | NO | N/A |
| GAS MAIN | NO | N/A |
| TELECOM | NO | N/A |
| CABLE TV | NO | N/A |
| ELECTRICITY | NO | N/A |
| OIL PIPES | NO | N/A |
| OTHER | NO | N/A |

| REV | DESCRIPTION | DRAWN | CHECKED | APPR | SURVEY DATE |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

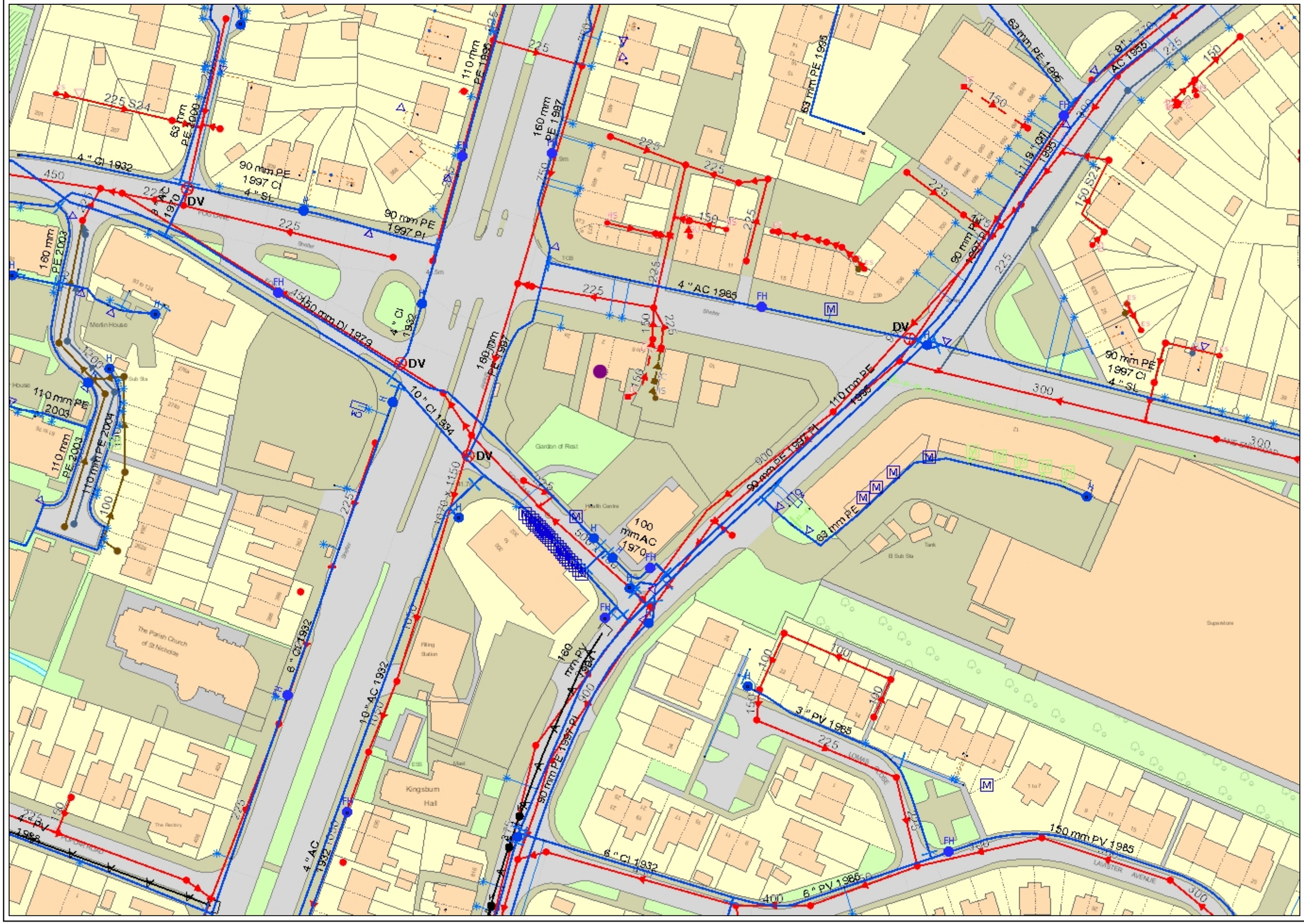
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| | | | | |
|---|---|---|---|---|
| PROJECT TITLE: Lane End Road, Burnage, M19 1WA | | | | |
| DRAWING DETAIL: CCTV DRAINAGE SURVEY. SHEET 1 OF 1 | | | | |
| CLIENT: HBI Associates Ltd | | | | SCALE: 1:200 |
| SURVEYOR: OB | SURVEY DATE: 26/03/2025 | CHECKED BY: DWR | APPROVED BY: DWR | DWG STATUS: FINAL |
| DRAWING NUMBER: 76187MCUG-01 | | | REVISION | ISSUE DATE: 27/03/2025 |

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Original Sheet Size A2H

## APPENDIX C – UNITED UTILITIES ASSET MAP AND PRE DEVELOPMENT




# United Utilities Maps for SafeDig

| | |
|---|---|
| **Date :** | 21/03/2025 08:06:00 |
| **Centre X:** | 385967 |
| **Centre Y:** | 391529 |
| **Scale :** | 1000 |
| **UserName:** | MULTICON |

## 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 0000813445 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.

United Utilities
Water for the North West

# WASTEWATER PRE-DEVELOPMENT ENQUIRY

United Utilities
Water for the North West

United Utilities Grasmere House, 2nd Floor
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP

**Response Date:** 26/03/2025

Dear Alfie

**Pre-Development Enquiry for Lane End Road, Manchester**

**UU Reference Number: 07226279**

We have assessed your application based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your strategy will need review by other authorities as part of the planning process. We advise conducting necessary site investigations to confirm viability of your proposals.

## Modelled Flood Risk

I can confirm that we do not have modelled flood risk within the vicinity of the proposed development.

Please note that our modelling data is indicative, and only representative of the 1:100year storm event.

Please see **comment 2** of the attached guidance sheet

## Asset Protection

1. We have reviewed our records and can confirm that there does not appear to be any charted public sewers located within the boundary of the proposed development.

Please see **comment 3** of the attached guidance sheet and **Working Near Our Pipelines Guidance document**

# WASTEWATER PRE-DEVELOPMENT ENQUIRY

United Utilities
Water for the North West

## Foul Water

Foul flow from this site will be allowed to drain into the public combined sewer system.

Our preferred point of discharge would be to the 500x780mm combined sewer within Fog Lane located south of your proposed development at an unrestricted rate.

**Manhole reference** SJ85919504, **Grid reference** 38530, 391523

Please see the images on **page 3** for clarification

## Surface Water

Follow the National Planning Policy Guidance drainage hierarchy and provide evidence for discounting higher options before considering public sewer discharge. Consult the Lead Local Flood Authority regarding surface water concerns.

Please see comment **4** within the guidance sheet

## Infiltration

Please see comment **4** within the guidance sheet

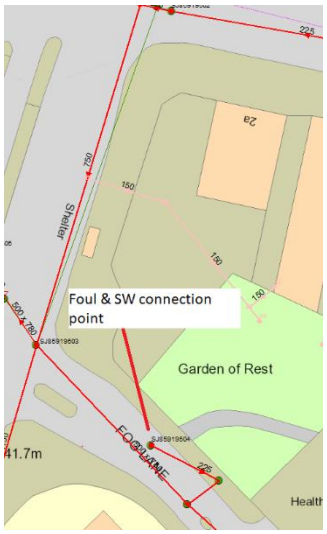
## Public Sewer

United Utilities will consider a connection to the 500x780mm diameter public combined sewer within Fog Lane located South of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities requests that any agreed rate does not exceed **5**l/s.

**Manhole reference** SJ85919504, **Grid reference** 38530, 391523

Please see images on **page 3** for clarification

## Site Images



Laura Owens
Customer Advisor Advanced
Developer Services & Metering
Customer Services
**T:** 0345 026 8989
unitedutilities.com

**If you feel you have received a good service from myself, please can you take two minutes to fill in the survey below. This will be much appreciated**

Visit: *https://unitedutilities.thewowawards.co.uk/nominate*

[redacted]
**Sent:** 13/01/2026 18:32
**To:** seweradoptions@uuplc.co.uk
**Subject:** RE: Automatic reply: REF - 07226279 - Lane End Road - Pre-development Enquiry

Hi Conor,

There have been some slight amendments to this scheme before submission to planning. The total site area and impermeable area has increased to 0.15ha and we're still planning to limit discharge to 5l/s. There are now 62 apartment units and 450m2 of commercial units. We are still designing to a discharge rate of 5l/s.

Let me know if you require any further information.

Kind regards,

**Alfie Cooper**
Senior Engineer
Craig House, 33 Ballbrook Avenue, Didsbury, Manchester M20 3JG
alfie.cooper@hbl.ltd
[redacted]

## Alfie Cooper

**From:** seweradoptions@uuplc.co.uk
**Sent:** 15 January 2026 12:57
**To:** Alfie Cooper
**Subject:** RE: REF - 07226279 - Lane End Road - Pre-development Enquiry

Warning: This email was sent from outside the organisation.

Hi Alfie,

Thanks for the update and the conformation of 5 l/s will still be acceptable.

Regards,

United Utilities
Water for the North West

**James Darlington**
Developer Engineer
Developer Services & Metering
**T:** 01925 429095
unitedutilities.com

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If you are happy with the service we have provided, please consider submitting a nomination in the following link – this only takes a moment and would be greatly appreciated: **unitedutilities.com/wow**

---------- Original Message ----------
**From:** seweradoptions@uuplc.co.uk [seweradoptions@uuplc.co.uk]
**Sent:** 14/01/2026 08:16
**To:** alfie.cooper@hbl.ltd
**Subject:** REF - 07226279 - Lane End Road - Pre-development Enquiry

Good Morning,

Your enquiry has been logged and sent to our engineer James Darlington and his contact number is [redacted]. Our service Level agreement is to respond to you within 10 working days.

Many thanks

## APPENDIX D – PROPOSED SITE LAYOUT

**Copyright © of this drawing belongs solely to Group/d Architects Ltd.** This drawing must only be used for the purpose for which it is supplied and its contents must not be copied for any purpose without written consent. All dimensions are to be checked on-site prior to commencing works. Any discrepancy found between information given on this drawing and that given elsewhere or recorded onsite shall be notified immediately to the project architect in writing.




| Rev | Date | Description | Drawn by |
|---|---|---|---|
| | | | -- |

Status/Stage
Planning

Project
Renold's Corner

Address
Lane End Road, Manchester, M19 1WA

| Scale | Date | Drawn by |
|---|---|---|
| 1:200 @ A1 | 12/12/2025 | ET |

Title
PROPOSED SITE PLAN

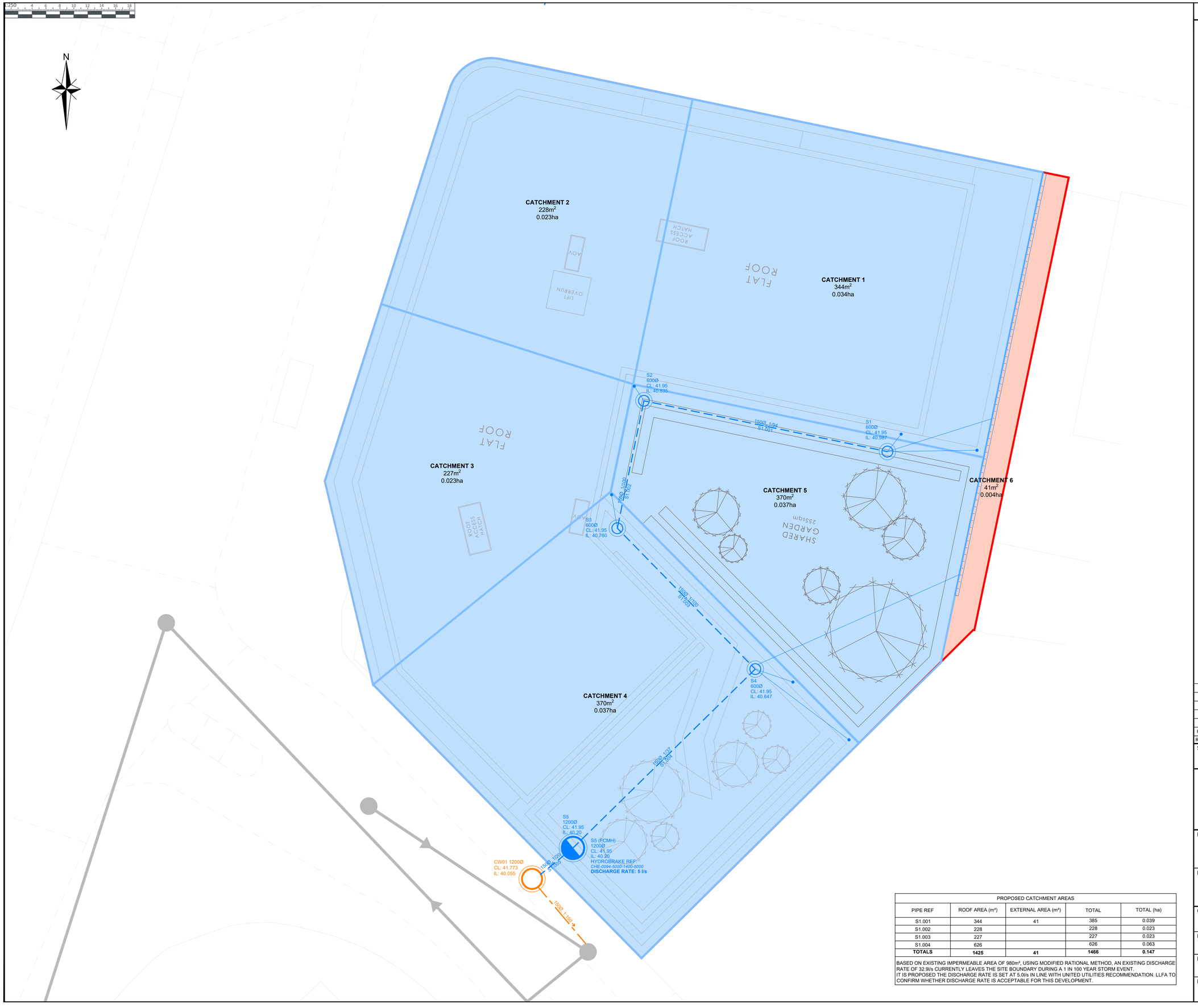
Dwg No
GDD25028-GDA-MB-ZZ-DR-A-1228

group/d architects

groupd.co.uk
4 St Paul's Square / Liverpool / L3 9SJ
0151 542 5027
info@groupdarchitects.com

RIBA Chartered Practice

## APPENDIX E – PROPOSED CONTRIBUTION AREA PLAN




| PROPOSED CATCHMENT AREAS | | | | |
|---|---|---|---|---|
| PIPE REF | ROOF AREA (m²) | EXTERNAL AREA (m²) | TOTAL | TOTAL (ha) |
| S1.001 | 344 | 41 | 385 | 0.039 |
| S1.002 | 228 | | 228 | 0.023 |
| S1.003 | 227 | | 227 | 0.023 |
| S1.004 | 626 | | 626 | 0.063 |
| **TOTALS** | **1425** | **41** | **1466** | **0.147** |

BASED ON EXISTING IMPERMEABLE AREA OF 980m², USING MODIFIED RATIONAL METHOD, AN EXISTING DISCHARGE RATE OF 32.9l/s CURRENTLY LEAVES THE SITE BOUNDARY DURING A 1 IN 100 YEAR STORM EVENT.
IT IS PROPOSED THE DISCHARGE RATE IS SET AT 5.0l/s IN LINE WITH UNITED UTILITIES RECOMMENDATION. LLFA TO CONFIRM WHETHER DISCHARGE RATE IS ACCEPTABLE FOR THIS DEVELOPMENT.

DO NOT SCALE FROM THIS DRAWING

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH
ALL OTHER HBL DRAWINGS ISSUED FOR THIS PROJECT

DRAINAGE NOTES:

1. THIS DRAWING IS SUBJECT TO APPROVAL BY LOCAL AUTHORITY, BUILDING CONTROL AND / OR SEWERAGE UNDERTAKER. ANY WORKS UNDERTAKEN PRIOR TO THE GRANTING OF THESE APPROVALS IS CARRIED OUT AT AT RISK TO OTHERS.
2. PRIOR TO COMMENCING WORK ON THE DRAINAGE, ALL EXISTING DRAINS, SEWERS MANHOLES AND OUTFALLS TO REMAIN SHALL BE LOCATED, IDENTIFIED AND A CCTV CONDITION SURVEY CARRIED OUT. WHERE NECESSARY, PROTECTION TO THE EXISTING DRAINAGE INFRASTRUCTURE SHALL BE PROVIDED.
3. ALL EXISTING SEWERS AND MANHOLES ABANDONED DUE TO THE PROPOSED WORKS ARE TO BE EITHER REMOVED, AND SUITABLY BACKFILLED OR GROUTED UP.
4. ALL MANHOLE COVERS TO COMPLY WITH BS.EN.124, AND BE KITEMARKED
5. COVER LEVELS FOR MANHOLES ARE APPROXIMATE ONLY AND SHOULD BE ADJUSTED TO MATCH SURROUNDING LEVELS.
6. IN BLOCK PAVED AREAS 'INFILL' TYPE COVERS SHOULD NOT BE USED, AND FRAMES MUST BE 150MM DEEP.

KEY - PLAN

SITE BOUNDARY
*TOTAL AREA 1466m² (0.147ha)*

PROPOSED HARDSTANDING
*TOTAL AREA: 41m²*

PROPOSED BUILDING
*TOTAL AREA: 1425m²*

PROPOSED PRIVATE SW DRAINAGE

*REFER TO TYPICAL DRAINAGE CONSTRUCTION DETAILS DRAWING NO.s*
***11051-HBL-XX-XX-DR-C-0114 - 0116** FOR FURTHER DETAILS*

| REV. | DATE | DRAWN | DESCRIPTION | CHKD | APPRD |
|---|---|---|---|---|---|
| P01 | 16.01.26 | AC | ISSUED FOR PLANNING | AC | AC |

STATUS DESCRIPTION: FOR COMMENT
STATUS: S1

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Consulting Civil & Structural Engineers

PROJECT
LANE END ROAD
BURNAGE

DRAWING TITLE
CATCHMENT AREA PLAN

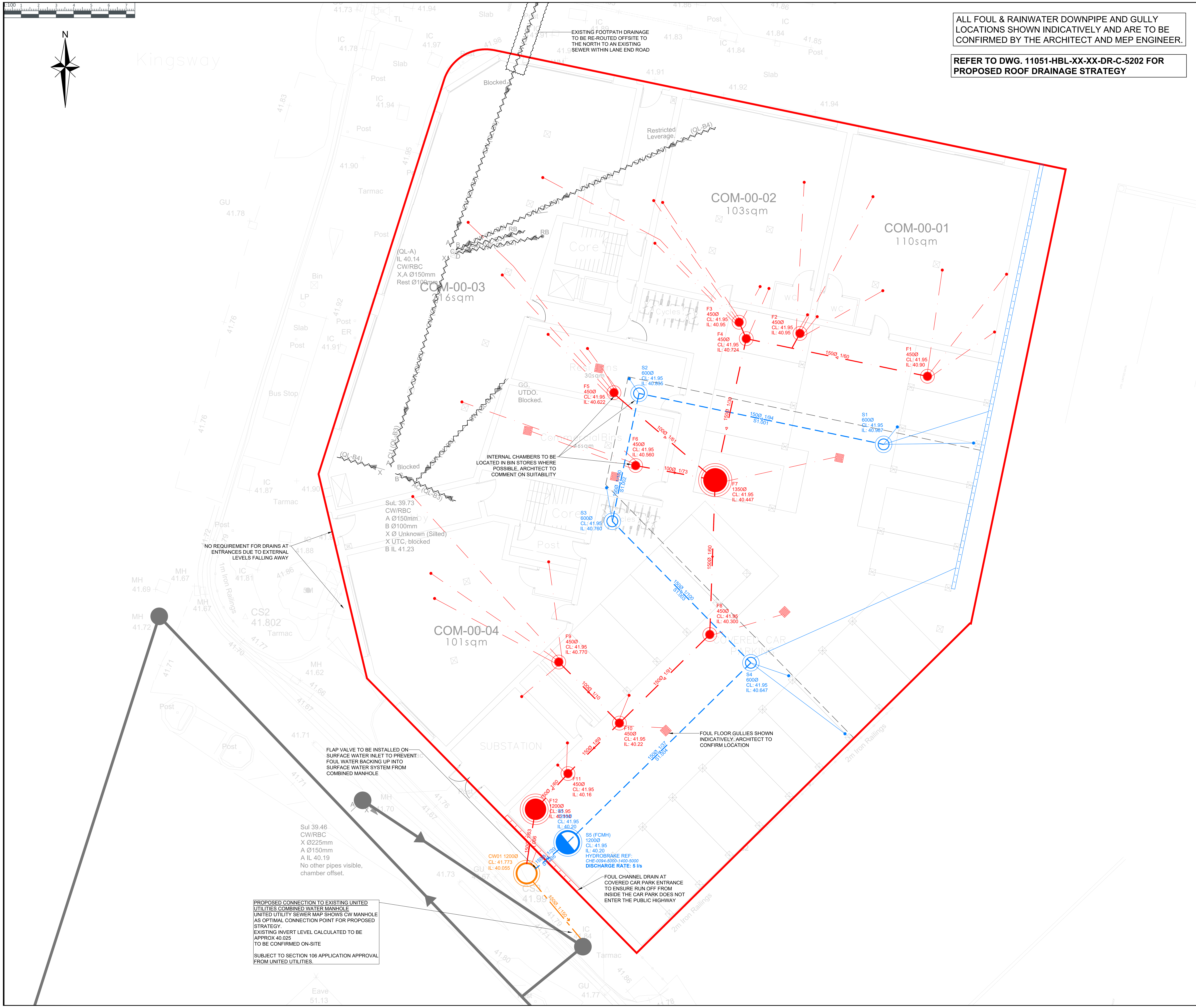
CLIENT
MAGNITUDE QS

| HBL REF. | DATE | SCALE(S) | |
|---|---|---|---|
| 11051 | 02.01.26 | 1:100 | A1 |

| DRAWN | CHECKED | APPROVED |
|---|---|---|
| JD | AC | AC |

DRAWING No.: 11051-HBL-XX-XX-DR-C-5203
REV.: P01

## APPENDIX F – PROPOSED DRAINAGE STRATEGY




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2. PRIOR TO COMMENCING WORK ON THE DRAINAGE, ALL EXISTING DRAINS, SEWERS MANHOLES AND OUTFALLS TO REMAIN SHALL BE LOCATED, IDENTIFIED AND A CCTV CONDITION SURVEY CARRIED OUT. WHERE NECESSARY, PROTECTION TO THE EXISTING DRAINAGE INFRASTRUCTURE SHALL BE PROVIDED.
3. ALL EXISTING SEWERS AND MANHOLES ABANDONED DUE TO THE PROPOSED WORKS ARE TO BE EITHER REMOVED, AND SUITABLY BACKFILLED OR GROUTED UP.
4. ALL MANHOLE COVERS TO COMPLY WITH BS.EN.124, AND BE KITEMARKED
5. COVER LEVELS FOR MANHOLES ARE APPROXIMATE ONLY AND SHOULD BE ADJUSTED TO MATCH SURROUNDING LEVELS.
6. IN BLOCK PAVED AREAS 'INFILL' TYPE COVERS SHOULD NOT BE USED, AND FRAMES MUST BE 150MM DEEP.

KEY - PLAN

- SITE BOUNDARY — *TOTAL AREA 1466m² (0.147ha)*
- PROPOSED PRIVATE SW DRAINAGE
- PROPOSED PRIVATE SW FLOW CONTROL MANHOLE
- PROPOSED PRIVATE FW DRAINAGE
- PROPOSED PRIVATE CW DRAINAGE
- EXISTING COMBINED UU SEWER
- PROPOSED RAINWATER DOWNPIPE
- PROPOSED FOUL WATER DOWNPIPE
- PROPOSED FOUL WATER CHANNEL DRAIN
- PROPOSED FOUL WATER FLOOR GULLY
- EXISTING TO BE ABANDONED
- EXISTING DRAINAGE

*REFER TO TYPICAL DRAINAGE CONSTRUCTION DETAILS DRAWING NO.s **11051-HBL-XX-XX-DR-C-0114 - 0116** FOR FURTHER DETAILS*

DESIGN IS BASED UPON INFORMATION AVAILABLE AT THE TIME.
DESIGN IS SUBJECT TO FULL REVIEW AS ADDITIONAL INFORMATION BECOMES AVAILABLE.
DESIGN IS SUBJECT TO FULL REVIEW UPON RECEIPT OF COMMENTS FROM

- DEVELOPMENT CONTROL
- LA PLANNING AUTHORITY
- SEWERAGE UNDERTAKER

SITE TO DISCHARGE TO EXISTING CW SEWER OFFSITE. TECHNICAL S106 APPROVAL SHOULD BE IN PLACE WITH LOCAL WATER AUTHORITY BEFORE CONNECTION IS MADE TO SYSTEM.

HYDRAULIC CALCULATIONS SHOW NO FLOODING ACROSS THE DEVELOPMENT AT A 1 IN 100+45YR CC EVENT; STORAGE PROVIDED WITHIN NETWORK CHAMBERS AND PIPES DURING TIMES OF CRITICAL FAILURE (MAINTENANCE NEGLECT OR DAMAGED PIPES), AN EMERGENCY OVERFLOW AS BEEN SET 300mm ABOVE THE MAXIMUM CALCULATED WATER LEVEL IN THE DESIGN EVENT. THE CASE OF FULL NETWORK FAILURE, PROPOSED SURFACE LEVELS AND EXISTING LEVELS SHOW EXCEEDANCE FLOWS OUT INTO FOG LANE TO THE SOUTH OF THE SITE

| REV. | DATE | DRAWN | DESCRIPTION | CHKD | APPRD |
|---|---|---|---|---|---|
| P01 | 16.01.26 | AC | ISSUED FOR COMMENT | AC | AC |

STATUS DESCRIPTION: FOR COMMENT — STATUS: S1

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PROJECT: LANE END ROAD BURNAGE

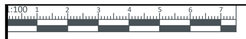
DRAWING TITLE: PROPOSED DRAINAGE STRATEGY SHEET 1 - GROUND FLOOR PLAN

CLIENT: MAGNITUDE QS

| HBL REF. | DATE | SCALE(S) | |
|---|---|---|---|
| 11051 | 02.01.26 | 1:100 | A1 |

| DRAWN | CHECKED | APPROVED |
|---|---|---|
| AC | AC | AC |

| DRAWING No. | REV. |
|---|---|
| 11051-HBL-XX-XX-DR-C-5201 | P01 |



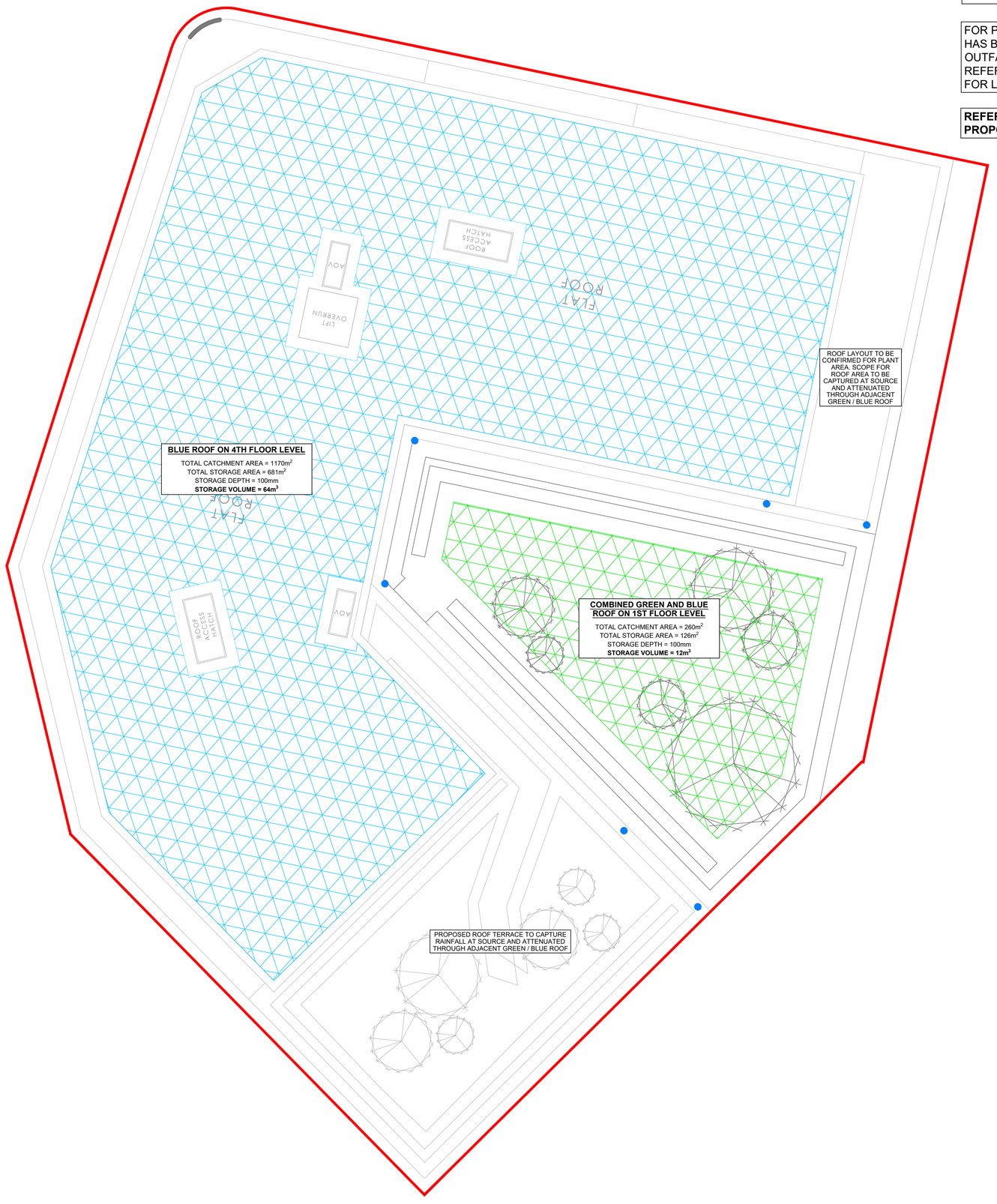




EXTENTS OF GREEN AND BLUE ROOFS, DEPTHS, STORAGE VOLUMES AVAILABLE AND RAINWATER DOWNPIPE LOCATIONS HAVE ALL BEEN SHOWN INDICATIVELY AND ARE TO BE CONFIRMED WITH THE ARCHITECT, CLIENT AND ROOF MANUFACTURER.

FOR PURPOSE OF HYDRAULIC MODELLING, THE ROOF HAS BEEN SPLIT INTO 5 CATCHMENTS, LIMITED TO 1l/s OUTFALL EACH.
REFER TO DRAWING REF. 11051-HBL-XX-XX-DR-C-5203 FOR LOCATIONS OF CATCHMENTS

**REFER TO DWG. 11051-HBL-XX-XX-DR-C-5201 FOR PROPOSED GROUND FLOOR DRAINAGE STRATEGY**




DO NOT SCALE FROM THIS DRAWING

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2. PRIOR TO COMMENCING WORK ON THE DRAINAGE, ALL EXISTING DRAINS, SEWERS MANHOLES AND OUTFALLS TO REMAIN SHALL BE LOCATED, IDENTIFIED AND A CCTV CONDITION SURVEY CARRIED OUT. WHERE NECESSARY, PROTECTION TO THE EXISTING DRAINAGE INFRASTRUCTURE SHALL BE PROVIDED.
3. ALL EXISTING SEWERS AND MANHOLES ABANDONED DUE TO THE PROPOSED WORKS ARE TO BE EITHER REMOVED, AND SUITABLY BACKFILLED OR GROUTED UP.
4. ALL MANHOLE COVERS TO COMPLY WITH BS.EN.124, AND BE KITEMARKED
5. COVER LEVELS FOR MANHOLES ARE APPROXIMATE ONLY AND SHOULD BE ADJUSTED TO MATCH SURROUNDING LEVELS.
6. IN BLOCK PAVED AREAS 'INFILL' TYPE COVERS SHOULD NOT BE USED, AND FRAMES MUST BE 150MM DEEP.

KEY - PLAN

SITE BOUNDARY
*TOTAL AREA 1466m² (0.147ha)*

PROPOSED RAINWATER DOWNPIPE

PROPOSED BLUE ROOF

PROPOSED COMBINED GREEN / BLUE ROOF

*REFER TO TYPICAL DRAINAGE CONSTRUCTION DETAILS DRAWING NO.s **11051-HBL-XX-XX-DR-C-0114 - 0116** FOR FURTHER DETAILS*

*BLUE AND GREEN ROOFS REDUCE AND SLOW ROOF RUNOFF BY PROVIDING TEMPORARY SURFACE WATER STORAGE AND RETENTION THROUGH VEGETATION AND SUBSTRATE LAYERS. THEY LOWER PEAK DISCHARGE RATES, REDUCE TOTAL RUNOFF VOLUMES, IMPROVE WATER QUALITY, AND OFFER ADDED ENVIRONMENTAL BENEFITS SUCH AS THERMAL REGULATION AND BIODIVERSITY ENHANCEMENT.*

DESIGN IS BASED UPON INFORMATION AVAILABLE AT THE TIME.
DESIGN IS SUBJECT TO FULL REVIEW AS ADDITIONAL INFORMATION BECOMES AVAILABLE.
DESIGN IS SUBJECT TO FULL REVIEW UPON RECEIPT OF COMMENTS FROM
- DEVELOPMENT CONTROL
- LA PLANNING AUTHORITY
- SEWERAGE UNDERTAKER

SITE TO DISCHARGE TO EXISTING CW SEWER OFFSITE. TECHNICAL S106 APPROVAL SHOULD BE IN PLACE WITH LOCAL WATER AUTHORITY BEFORE CONNECTION IS MADE TO SYSTEM.

HYDRAULIC CALCULATIONS SHOW NO FLOODING ACROSS THE DEVELOPMENT AT A 1 IN 100+45YR CC EVENT; STORAGE PROVIDED WITHIN NETWORK CHAMBERS AND PIPES DURING TIMES OF CRITICAL FAILURE (MAINTENANCE NEGLECT OR DAMAGED PIPES), AN EMERGENCY OVERFLOW AS BEEN SET 300mm ABOVE THE MAXIMUM CALCULATED WATER LEVEL IN THE DESIGN EVENT. THE CASE OF FULL NETWORK FAILURE, PROPOSED SURFACE LEVELS AND EXISTING LEVELS SHOW EXCEEDANCE FLOWS OUT INTO FOG LANE TO THE SOUTH OF THE SITE

| REV. | DATE | DRAWN | DESCRIPTION | CHKD | APPRD |
|---|---|---|---|---|---|
| P01 | 16.01.26 | AC | ISSUED FOR COMMENT | AC | AC |

STATUS DESCRIPTION: FOR COMMENT
STATUS: S1

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Consulting Civil & Structural Engineers

PROJECT
LANE END ROAD
BURNAGE

DRAWING TITLE
PROPOSED DRAINAGE STRATEGY
SHEET 2 - ROOF PLAN

CLIENT
MAGNITUDE QS

| HBL REF. | DATE | SCALE(S) | |
|---|---|---|---|
| 11051 | 02.01.26 | 1:100 | A1 |

| DRAWN | CHECKED | APPROVED |
|---|---|---|
| AC | AC | AC |

DRAWING No.: 11051-HBL-XX-XX-DR-C-5202
REV.: P01

## APPENDIX G – SURFACE WATER HYDRAULIC CALCULATIONS

| Project: | Date: | | |
|---|---|---|---|
| 11051 - Lane End Road | 15/01/2026 | | |
| | Designed by: | Checked by: | Approved By: |
| | AC | AC | AC |
| Report Details: | Company Address: | | |
| Type: Junctions<br>Storm Phase: Surface Network 1 | Craig House<br>33 Ballbrook Avenue<br>M20 3JG | | |

| Name | Junction Type | Easting (m) | Northing (m) | Cover Level (m) | Depth (m) | Invert Level (m) | Chamber Shape | Diameter (m) |
|---|---|---|---|---|---|---|---|---|
| S1 | Manhole | 385956.998 | 391545.576 | 41.950 | 0.963 | 40.987 | Circular | 1.200 |
| S2 | Manhole | 385943.017 | 391548.492 | 41.950 | 1.115 | 40.835 | Circular | 1.200 |
| S3 | Manhole | 385941.490 | 391541.175 | 41.950 | 1.190 | 40.760 | Circular | 1.200 |
| S4 | Manhole | 385949.411 | 391533.086 | 41.950 | 1.303 | 40.647 | Circular | 1.200 |
| S5 | Manhole | 385938.945 | 391522.819 | 41.950 | 1.750 | 40.200 | Circular | 1.400 |

| Name | Lock |
|---|---|
| S1 | None |
| S2 | None |
| S3 | None |
| S4 | None |
| S5 | None |

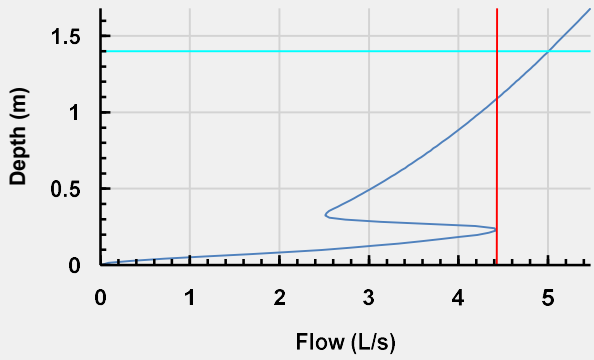
## Inlets

| Junction | Inlet Name | Incoming Item(s) | Bypass Destination | Capacity Type |
|---|---|---|---|---|
| S1 | Inlet | CA6<br>CA1 | (None) | No Restriction |
| S2 | Inlet | S1.001<br>CA2 | (None) | No Restriction |
| S3 | Inlet | S1.002<br>CA3 | (None) | No Restriction |
| S4 | Inlet | S1.003<br>CA4<br>CA5 | (None) | No Restriction |
| S5 | Inlet | S1.004 | (None) | No Restriction |

## Outlets

| Junction | Outlet Name | Outgoing Connection | Outlet Type |
|---|---|---|---|
| S1 | Outlet | S1.001 | Free Discharge |
| S2 | Outlet | S1.002 | Free Discharge |
| S3 | Outlet | S1.003 | Free Discharge |
| S4 | Outlet | S1.004 | Free Discharge |
| S5 | Outlet | (None) | Hydro-Brake® |

| | |
|---|---|
| Invert Level (m) | 40.200 |
| Design Depth (m) | 1.400 |
| Design Flow (L/s) | 5.0 |
| Objective | Minimise Upstream Storage Requirements |
| Application | Surface Water Only |
| Sump Available | ☐ |
| Unit Reference | CHE-0094-5000-1400-5000 |



| Project: | Date: | | |
|---|---|---|---|
| 11051 - Lane End Road | 15/01/2026 | | |
| | Designed by: | Checked by: | Approved By: |
| | AC | AC | AC |
| Report Details: | Company Address: | | |
| Type: Connections<br>Storm Phase: Surface Network 1 | Craig House<br>33 Ballbrook Avenue<br>M20 3JG | | |

| Name | Length (m) | Connection Type | Slope (1:X) | Manning's n | Colebrook-White Roughness (mm) | Diameter / Base Width (mm) | Upstream Cover Level (m) | Upstream Invert Level (m) |
|---|---|---|---|---|---|---|---|---|
| S1.002 | 7.475 | Pipe | 99.930 | | 0.6 | 150 | 41.950 | 40.835 |
| S1.003 | 11.321 | Pipe | 100.010 | | 0.6 | 150 | 41.950 | 40.760 |
| S1.001 | 14.282 | Pipe | 93.715 | | 0.6 | 150 | 41.950 | 40.987 |
| S1.004 | 14.661 | Pipe | 32.828 | | 0.6 | 150 | 41.950 | 40.647 |

| Name | Downstream Cover Level (m) | Downstream Invert Level (m) | Part Family | Lock |
|---|---|---|---|---|
| S1.002 | 41.950 | 40.760 | | None |
| S1.003 | 41.950 | 40.647 | | None |
| S1.001 | 41.950 | 40.835 | | None |
| S1.004 | 41.950 | 40.200 | | None |

| Project: | Date: | | |
|---|---|---|---|
| 11051 - Lane End Road | 15/01/2026 | | |
| | Designed by: | Checked by: | Approved By: |
| | AC | AC | AC |
| Report Details: | Company Address: | | |
| Type: Manhole Schedule<br>Storm Phase: Surface Network 1 | Craig House<br>33 Ballbrook Avenue<br>M20 3JG | | |

| Name | Cover Level (m)<br>Invert Level (m) | Manhole Size (m) | Connection Details | | | | Type |
|---|---|---|---|---|---|---|---|
| Coordinates (m) | Depth (m) | | Incoming Connections | Connection Type | Connection Invert (m) | Connection Size (mm) | Junction Type |
| | | | Outgoing Connections | | | | Cover |
| S1 | 41.950<br>40.987 | Diameter / Length: 1.200 | | | | | Manhole |
| E:385956.998<br>N:391545.576 | 0.963 | | {a} S1.001 | Pipe | 40.987 | Diam/Width:150 | Not Applicable |
| S2 | 41.950<br>40.835 | Diameter / Length: 1.200 | {1} S1.001 | Pipe | 40.835 | Diam/Width:150 | Manhole |
| E:385943.017<br>N:391548.492 | 1.115 | | {a} S1.002 | Pipe | 40.835 | Diam/Width:150 | Not Applicable |
| S3 | 41.950<br>40.760 | Diameter / Length: 1.200 | {1} S1.002 | Pipe | 40.760 | Diam/Width:150 | Manhole |
| E:385941.490<br>N:391541.175 | 1.190 | | {a} S1.003 | Pipe | 40.760 | Diam/Width:150 | Not Applicable |
| S4 | 41.950<br>40.647 | Diameter / Length: 1.200 | {1} S1.003 | Pipe | 40.647 | Diam/Width:150 | Manhole |
| E:385949.411<br>N:391533.086 | 1.303 | | {a} S1.004 | Pipe | 40.647 | Diam/Width:150 | Not Applicable |
| S5 | 41.950<br>40.200 | Diameter / Length: 1.400 | {1} S1.004 | Pipe | 40.200 | Diam/Width:150 | Manhole |
| E:385938.945<br>N:391522.819 | 1.750 | | | | | | Not Applicable |

| Project: | Date: | | |
|---|---|---|---|
| 11051 - Lane End Road | 15/01/2026 | | |
| | Designed by: | Checked by: | Approved By: |
| | AC | AC | AC |
| Report Details: | Company Address: | | |
| Type: Inflow Summary<br>Storm Phase: Surface Network 1 | Craig House<br>33 Ballbrook Avenue<br>M20 3JG | | |

| Inflow Label | Connected To | Flow (L/s) | Runoff Method | Area (ha) | Percentage Impervious (%) | Urban Creep (%) | Adjusted Percentage Impervious (%) | Area Analysed (ha) |
|---|---|---|---|---|---|---|---|---|
| CA1 | S1 | | Time of Concentration | 0.034 | 100 | 0 | 100 | 0.034 |
| CA2 | S2 | | Time of Concentration | 0.023 | 100 | 0 | 100 | 0.023 |
| CA3 | S3 | | Time of Concentration | 0.023 | 100 | 0 | 100 | 0.023 |
| CA4 | S4 | | Green Roof | 0.026 | | 0 | | 0.026 |
| CA5 | S4 | | Time of Concentration | 0.037 | 100 | 0 | 100 | 0.037 |
| CA6 | S1 | | Time of Concentration | 0.004 | 100 | 0 | 100 | 0.004 |
| **TOTAL** | | **0.0** | | **0.147** | | | | **0.147** |

| Project: | Date: | | |
|---|---|---|---|
| 11051 - Lane End Road | 15/01/2026 | | |
| | Designed by: | Checked by: | Approved By: |
| | AC | AC | AC |
| Report Details: | Company Address: | | |
| Type: Network Design Criteria<br>Storm Phase: Surface Network 1 | Craig House<br>33 Ballbrook Avenue<br>M20 3JG | | |

## Flow Options

| | |
|---|---|
| Peak Flow Calculation | (UK) Modified Rational Method |
| Min. Time of Entry (mins) | 5 |
| Max. Travel Time (mins) | 30 |

## Pipe Options

| | |
|---|---|
| Lock Slope Options | None |
| Design Options | Minimise Excavation |
| Design Level | Level Soffits |
| Min. Cover Depth (m) | 1.200 |
| Min. Slope (1:X) | 500.00 |
| Max. Slope (1:X) | 40.00 |
| Min. Velocity (m/s) | 1.0 |
| Max. Velocity (m/s) | 3.0 |
| Use Flow Restriction | ☐ |
| Reduce Channel Depths | ☐ |

## Manhole Options

| | |
|---|---|
| Apply Offset | ☐ |

| Project: | Date: | | |
|---|---|---|---|
| 11051 - Lane End Road | 15/01/2026 | | |
| | Designed by: | Checked by: | Approved By: |
| | AC | AC | AC |
| Report Details: | Company Address: | | |
| Type: Outfall Details<br>Storm Phase: Surface Network 1 | Craig House<br>33 Ballbrook Avenue<br>M20 3JG | | |

## Outfalls

| Outfall | Outfall Type | Fixed Surcharged Level (m) | Level Curve |
|---|---|---|---|
| S5 | Free Discharge | | |

| Project: | Date: | | |
|---|---|---|---|
| 11051 - Lane End Road | 15/01/2026 | | |
| | Designed by: | Checked by: | Approved By: |
| | AC | AC | AC |
| Report Title: | Company Address: | | |
| Rainfall Analysis Criteria | Craig House<br>33 Ballbrook Avenue<br>M20 3JG | | |

| | |
|---|---|
| Runoff Type | Dynamic |
| Output Interval (mins) | 5 |
| Time Step | Default |
| Urban Creep | Use Catchment Values |
| Junction Flood Risk Margin (mm) | 0 |
| Perform No Discharge Analysis | ☐ |

| Project: 11051 - Lane End Road | Date: 15/01/2026 | | |
|---|---|---|---|
| | Designed by: AC | Checked by: AC | Approved By: AC |
| Report Details: Type: Inflows Summary Storm Phase: Surface Network 1 | Company Address: Craig House 33 Ballbrook Avenue M20 3JG | | |

**Critical Storm Per Item: Rank By: Max. Inflow**

| Inflow | Storm Event | Inflow Area (ha) | Max. Inflow (L/s) | Total Inflow Volume ($m^3$) |
|---|---|---|---|---|
| CA2 | FEH: 2 years: +0 %: 15 mins: Summer | 0.02 | 0.5 | 0.673 |
| CA3 | FEH: 2 years: +0 %: 15 mins: Summer | 0.02 | 0.5 | 0.673 |
| CA4 | FEH: 100 years: +45 %: 120 mins: Winter | 0.03 | 1.4 | 7.540 |
| CA5 | FEH: 100 years: +45 %: 60 mins: Summer | 0.04 | 10.1 | 11.139 |
| CA1 | FEH: 2 years: +0 %: 15 mins: Summer | 0.03 | 0.5 | 0.673 |
| CA6 | FEH: 100 years: +45 %: 15 mins: Summer | 0.00 | 3.2 | 1.418 |

| Project: | Date: | | |
|---|---|---|---|
| 11051 - Lane End Road | 15/01/2026 | | |
| | Designed by: | Checked by: | Approved By: |
| | AC | AC | AC |
| Report Details: | Company Address: | | |
| Type: Junctions Summary<br>Storm Phase: Surface Network 1 | Craig House<br>33 Ballbrook Avenue<br>M20 3JG | | |

**Critical Storm Per Item: Rank By: Max. Depth**

| Junction | Storm Event | Cover Level (m) | Invert Level (m) | Max. Level (m) | Max. Depth (m) | Max. Inflow (L/s) | Max. Resident Volume (m³) | Max. Flooded Volume (m³) | Max. Outflow (L/s) | Total Discharge Volume (m³) | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S1 | FEH: 100 years: +45 %: 60 mins: Winter | 41.950 | 40.987 | 41.559 | 0.572 | 2.0 | 0.647 | 0.000 | 2.0 | 5.811 | Surcharged |
| S2 | FEH: 100 years: +45 %: 60 mins: Winter | 41.950 | 40.835 | 41.558 | 0.723 | 2.5 | 0.818 | 0.000 | 2.6 | 9.422 | Surcharged |
| S3 | FEH: 100 years: +45 %: 60 mins: Winter | 41.950 | 40.760 | 41.559 | 0.799 | 3.1 | 0.904 | 0.000 | 2.9 | 13.492 | Surcharged |
| S4 | FEH: 100 years: +45 %: 60 mins: Winter | 41.950 | 40.647 | 41.556 | 0.909 | 9.8 | 1.028 | 0.000 | 6.2 | 27.376 | Surcharged |
| S5 | FEH: 100 years: +45 %: 60 mins: Winter | 41.950 | 40.200 | 41.545 | 1.345 | 6.2 | 2.069 | 0.000 | 4.9 | 25.608 | OK |

| Project: 11051 - Lane End Road | Date: 15/01/2026 | | |
|---|---|---|---|
| | Designed by: AC | Checked by: AC | Approved By: AC |
| Report Details: Type: Connections Summary Storm Phase: Surface Network 1 | Company Address: Craig House 33 Ballbrook Avenue M20 3JG | | |

**Critical Storm Per Item: Rank By: Max. Flow**

| Connection | Storm Event | Connection Type | From | To | Upstream Cover Level (m) | Max. US Water Level (m) | Max. Flow Depth (m) | Discharge Volume ($m^3$) | Max. Velocity (m/s) | Flow / Capacity | Max. Flow (L/s) | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S1.002 | FEH: 100 years: +45 %: 15 mins: Summer | Pipe | S2 | S3 | 41.950 | 40.885 | 0.051 | 2.689 | 0.7 | 0.22 | 3.8 | OK |
| S1.003 | FEH: 100 years: +45 %: 15 mins: Summer | Pipe | S3 | S4 | 41.950 | 40.812 | 0.062 | 3.304 | 0.9 | 0.23 | 4.1 | OK |
| S1.001 | FEH: 100 years: +45 %: 15 mins: Summer | Pipe | S1 | S2 | 41.950 | 41.033 | 0.048 | 2.065 | 0.7 | 0.2 | 3.6 | OK |
| S1.004 | FEH: 100 years: +45 %: 240 mins: Summer | Pipe | S4 | S5 | 41.950 | 41.432 | 0.150 | 84.257 | 0.5 | 0.23 | 7.2 | Surcharged |

| Project: | Date: | | |
|---|---|---|---|
| 11051 - Lane End Road | 15/01/2026 | | |
| | Designed by: | Checked by: | Approved By: |
| | AC | AC | AC |
| Report Details: | Company Address: | | |
| Type: Phase Management<br>Storm Phase: Surface Network 1 | Craig House<br>33 Ballbrook Avenue<br>M20 3JG | | |

**Surface Network 1**
**FEH: 100 years: Increase Rainfall (%): +45: 60 mins: Winter**

## Tables

| Name | Max. Inflow (L/s) | Total Inflow Volume (m³) | Max. Outflow (L/s) | Total Outflow Volume (m³) |
|---|---|---|---|---|
| S5 | | | 4.9 | 25.608 |
| TOTAL | 12.3 | 26.945 | 4.9 | 25.608 |

## Graphs

