







Land off Elizabeth Street, Cheetham Hill, Manchester

Flood Risk Assessment and Drainage Strategy

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1.0 Introduction

1.1 Project Background

1.1.1 Curtins was appointed by Kier Property Limited to provide a Flood Risk Assessment (FRA) and Drainage Strategy (DS) for the proposed development on the brownfield site situated adjacent to Elizabeth Street, Cheetham Hill, Manchester. The nearest postcode to the site is M8 8JJ, and the site is centred around Grid Reference 384190, 400168.

1.1.2 The FRA provides information on the nature of flood risk at the site, following Government guidance with regards to development and flood risk. The FRA outlines the drainage requirements for the proposed site, with regards to relevant standards, guidance, and good practice.

1.1.3 The report is based on currently available information and preliminary discussions.

1.1.4 Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

1.1.5 Where the proposed works to which this report refers are undertaken more than twelve months following the issue of this report, Curtins shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to Curtins.

1.2 Scope of Assessment

1.2.1 The assessment is to be undertaken in accordance with the standing advice and requirements of the Environment Agency (EA) for Flood Risk Assessments as outlined in the Communities and Local Governments Planning Policy Guidance to the National Planning Policy Framework (NPPF).

1.2.2 The assessment will:

- Investigate all potential risks of flooding to the site,
- Consider the impact the development may have elsewhere with regards to flooding,
- Consider proposals to mitigate any potential risk of flooding determined to be present; and
- Consider foul and surface water drainage proposals to mitigate flood risk from the site.

1.2.3 The Site lies within the Manchester Conurbation Core Critical Drainage Area (as identified in the Manchester, Salford and Trafford Level 2 Hybrid SFRA).

1.2.4 The total site area is approximately 1.98 hectares and following scrutiny of the UK Government Flood Map for Planning it has been identified that the existing site lies entirely within an area classified as

Flood Zone 1 indicating that the probability of flooding from rivers or sea (not taking into account flood defences or climate change) is low. Following scrutiny of the UK Government Long Term Flood Risk Assessment maps, it has been identified that the existing site lies within an area which is at 'very low' residual risk of flooding from surface water and does not lie within the maximum extents of reservoir flooding risk.

1.2.5 Since the site is in a Critical Drainage Area and has an area greater than 1 hectare, a Flood Risk Assessment is required to support a planning application also taking into consideration the management of surface water run-off.

1.2.6 In April 2015, the Government made changes to the National Planning Policy Framework which made Sustainable Urban Drainage Systems (SuDS) a material consideration in the determination of planning applications for 'major' developments.

1.2.7 A Drainage Strategy will therefore be required as part of the Full Planning Application for the development, as the development is considered to be 'major' development by the Town and Country Planning (Development Management Procedure) (England) Order 2015.

1.2.8 This FRA reviews the following information:

- Environment Agency flood maps for rivers and sea flooding.
- UK Government Long Term Flood Risk Information for surface water flooding and reservoir flooding.
- Manchester City, Salford City and Trafford Councils Level 1 Hybrid Strategic Flood Risk Assessment (SFRA) published in March 2010.
- Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA, User Guide, Final, dated May 2010.
- Manchester City, Salford City and Trafford Councils Level 2 Hybrid Strategic Flood Risk Assessment (SFRA) published in March 2011.
- Preliminary Flood Risk Assessment (PFRA) for Manchester County Council dated May 2011.
- United Utilities Public Sewer Records dated November 2021.
- Manchester City Council SuDS Requirements for New Developments.
- Topographical Survey carried out by Survey Systems, dated October 2021.
- Phase 1 Desk Study carried out by Curtins dated October 2021.
- Utility Survey carried out by Layer Surveys, dated December 2021.
- CCTV Drainage Survey carried out by Layer Surveys, dated December 2021.

1.3 Proposed Development

1.3.1 The development is expected to comprise of the proposed demolition of the existing unit and redevelopment of site for industrial and logistics uses (Classes B2 and B8) with ancillary office floorspace, including provision of revised access arrangements from Elizabeth Street and all associated works and landscaping.

1.3.2 The Proposed Site Layout is enclosed in *Appendix A.*

2.0 Existing Site Details

2.1 History and Current Use

2.1.1 The Site is located to the south of Elizabeth Street, in Cheetham Hill, approximately 1.5 km to the north of Manchester city centre. The majority of the Site is currently derelict brownfield land which includes an existing, vacant commercial unit along the north-east frontage to Elizabeth Street. See Figure 1.

2.1.2 Vehicular access to the Site is currently via a narrow and un-adopted road off Elizabeth Street (Bridcam Street) which has fallen into a state of disrepair.

2.1.3 The Site is irregular in shape and is surrounded by other commercial and employment uses to the north-east, south-east and south-west, with a residential apartment block (St David's Court) to the north-east. Further to the north lie the residential areas of Cheetham Hill. Manchester Fort Shopping Park, one of the City's largest out of the centre retail destinations is located 250m to the east on Cheetham Hill Road, which connects the Site with the city centre.

2.1.4 The area proposed for development is entirely brownfield, with historic mapping showing buildings existing on the site from the 1950's through to approximately 2006 for various uses. From this point, the buildings on site appear to have been demolished and the site is referenced as a recycling site up to 2021.



Figure 1: Aerial Photograph (© Google 2021)

2.2 Existing Watercourses and Other Waterbodies

2.2.1 No above ground watercourses have been identified within the proposed site or immediately adjacent to the site.

2.2.2 The River Irk is located approximately 700m east of the site, flowing in a southerly direction towards Manchester City Cente.

2.2.3 The River Medlock (which is a 'main river') is located approximately 1km south-west of the site from which point it flows in a westerly direction along the boundary of Manchester and Salford.

2.3 'Hidden' Watercourses

2.3.1 A hidden (or 'lost') watercourse has been identified in the Manchester, Salford and Trafford Level 2 Hybrid SFRA, which appears to cross below the site at two locations. The hidden watercourse crosses the site from east to west where combines with another section of the hidden watercourse which also crosses the west corner of the site (see *Figure 2*).



Figure 2: Extract from Manchester, Salford and Trafford Level 2 SFRA Surface Water Flooding Maps (approximate routes of lost watercourse shown as purple dashed line).

2.3.2 It is difficult to locate the specific routes of lost watercourses since they are culverted underneath the urban areas around Manchester and in some cases may have been abandoned over time.

2.3.3 Manchester Lead Local Flood Authority (LLFA) have been consulted and have advised that they do not hold any further information with regards to the potential route and details of the lost watercourse. The LLFA have advised that investigations should be undertaken to determine if the watercourse enter the site. The Geo-Environmental Engineer has provided the following summary in relation to the historic information available and the site investigation works completed at the site to date:

Earliest historical OS mapping for the site dated 1848 does not show evidence of a water course on site with the site occupied by fields. A possible water feature is noted to the south-east orientated approximately southwest to northeast, which splits circa 50m southeast with branches orientated approximately north-west to south-east and north-east to south-west, the latter is shown adjacent to the southern site boundary. By the next available historic mapping (dated 1892-1893) there is no evidence of this potential off site water course and no evidence of a water course shown on site. Instead, the site and area to the south are occupied by a series of extensive 'clay pits' associated with a brick works circa 100m southeast. Clay pits remain present across the site until early 1960s when a depot is shown in the northwest and some smaller buildings. A car breakers yard is shown on site in the 1970s with a travelling crane on the east. Various works and warehouses and then present to the south of site and no evidence of the potential historic water course is shown.

The first phase of site investigation works was undertaken in May 2020 and comprised four cable percussive boreholes to up to 11.50m depth bgl and 10 machine excavated trial pits to up to 3.50m bgl. Made ground was found to be extensive across the site with the base not determined in all locations but BH05, where the base was determined at 6.00m bgl. A second phase of ground investigation has been undertaken in December 2021 with preliminary results indicating made ground depth varying from 6 to 18m bgl. The extensive made ground is likely to be associated with the backfilling of historic clay pits across the site. Considering the depth of made ground on site it is considered unlikely that any historic water courses remain, they are likely to have been diverted during clay pit excavation. Furthermore, no evidence of a culvert has been found in ground investigation work to date.

In conclusion, historic maps do not show evidence of a historic water course on site, the feature therefore either pre-dates OS map records or the feature is off-site (potential feature shown to the south). Where the feature did exist on site it is considered likely that it would have been diverted as part of deep clay pit excavations and later backfilling. Based on the above it is considered highly unlikely that the historic water courses identified remain on the site.

2.3.4 We have summarised the above to the LLFA and we are currently awaiting a response. The LLFA correspondence is enclosed in *Appendix F.*

2.4 Existing Drainage

2.4.1 The public sewer records have been obtained for the development site, and are enclosed in *Appendix B*.

2.4.2 The public sewer records indicate that the following public sewers are recorded within the site:

- A 225mm combined sewer crosses the site access, located to the rear of the existing properties fronting onto Elizabeth Street. The sewer appears to flow in a west to east direction however, there are no accessible locations within the site or in public accessible land and therefore the

existing position, size, depth and condition is unknown. Further works will therefore be required to establish the sewer status which will require access into a third-party land or agreement with United Utilities to carry out slip trenches across the sewer as it crosses the site to confirm its alignment.

2.4.3 The public sewer records indicate that the following public sewers are located within the vicinity of the site:

- A 400x450mm combined public sewer is located north of the development site, within Elizabeth Street and appears to flow in a north-westerly direction. Based on the sewer record information it appears that the sewer has a nearby bifurcation (UU MH2205) that separates the flows in Elizabeth Street in both direction along the road. The sewer divides the flows to go into separate lines at Bent Street (east) and Sherborne Street (west).
- The 225mm sewer noted above (within the site) flows east towards the sewer in Bent Street.
- Southwest of the site there is a 375 public combined sewer at Bradstone Road, and also a 375mm combine line in Broughton Street. Both of these flow to the west and join with the main combined sewer at Sherborne Street.

2.4.4 There are further public sewers identified on the public sewer records within the wider vicinity of the site, but these are not considered relevant to the scheme.

2.4.5 A GPR Utilities Survey has been carried out and is enclosed in *Appendix C*.

2.4.6 A CCTV Drainage Survey has also been carried out and is enclosed in *Appendix D*.

2.4.7 The GPR/CCTV drainage surveys have identified the following:

- The surveyor completed a walk over site and did not identify drainage within the site boundary except of one chamber located within the north-east of the site. The manhole was not noted on the topographical survey; however, the manhole was full of debris and therefore no access could be made to trace any upstream or downstream connections and is likely to be redundant.
- The 225mm combined public sewer immediately north of the site, which crosses through the site boundary was attempted to be surveyed, however all access points were located within privately owned land to the properties fronting on to Elizabeth Street and therefore this sewer was unable to be surveyed.
- The 400 x 450mm combined public sewer within Elizabeth Street was attempted to be surveyed from various access points along the sewer. Due to high water levels in the sewer, the survey was unable to be completed, however a manhole card (Ref 2203) was recorded, which indicates that the invert level is approximately 53.080m AoD and confirms the main sewer is 450 x 400mm brick construction.

2.4.8 The site has previously been used as residential and commercial properties, and as such has existing private drainage features are likely to exist within the site, however as the site is heavily overgrown, drainage features have not yet been identified, however it is anticipated that existing drainage is likely to be redundant. It is recommended that drainage is recorded and confirmed with the Engineers once site strip works are being completed.

2.4.9 It is recommended that a further survey is completed once access can be made available to the rear of the properties on Elizabeth Street. The survey is required to confirm the size, condition, location, and depths of the existing public sewer – specifically where it crosses the site boundary so the sewer can be adequately protected throughout development and so proposed designs can be co-ordinating with the sewer position.

2.5 Topography

2.5.1 A topographical survey has been carried out on the proposed site, and is enclosed in *Appendix C*.

2.5.2 Large areas along the north, east, south and west of the site were unable to be fully surveyed due to large areas of dense vegetation and therefore it is recommended that further topographical information is obtained once the site has been cleared to determine tie in points to the site boundary. However, based on the information available the site appears to follow a general slope of north to south.

2.5.3 The levels at the site access from Elizabeth Street on to Bridcam Street are at approximately 56.5m AoD. Levels within Bridcam Street are relatively level undulating between 56.5-56.6m AoD.

2.5.4 The levels within the main site area appear to fall from north to south, however inaccessibility to areas on site limits the wider topographical information. There appears to be localised bunding within the south-western area of the site.

2.5.5 The levels within the main site area appear to slope between 56.500m AoD and 55.00m AoD.

2.6 Geology

2.6.1 Historically the site has been used for agriculture and clay extraction, therefore it is anticipated that the Made ground contains infill clay pits and superficial deposits are most likely Devensian Till. Geological mapping indicates bedrock is the Chester Formation - Sandstone.

2.6.2 The site investigation information confirms that a consistent groundwater body cannot be determined, this is likely owing to the variable areas of fill in former clay pits across the site. It is likely that perched groundwater is prevalent across the site.

2.6.3 The site is not located within a Source Protection Zone.

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3.0 Development and Flood Risk

3.1 National Planning Policy Framework (NPPF) and Planning Practice Guidance

3.1.1 In July 2021, the Department of Communities and Local Government published the National Planning Policy framework document (NPPF) and the Planning Practice Guidance was published in March 2014 which provides guidance on how flood risk should be assessed during the planning and development process.

Table 1: (Extract from Planning Practice Guidance) Flood Zone Classifications

These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's Flood Map for Planning (Rivers and Sea), available on the Environment Agency's web site, as indicated in the table below.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	**This zone comprises land where water has to flow or be stored in times of flood.** Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Table 2: (Extract from Planning Practice Guidance) Flood Risk Vulnerability Classification

Essential Infrastructure • Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly Vulnerable • Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').
More Vulnerable • Hospitals • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill* and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Less Vulnerable

- Police, ambulance and fire stations which are **not** required to be operational during flooding.
- Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'More Vulnerable' class; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill* and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.

Water-Compatible Development

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

Table 3: (Extract from Planning Practice Guidance) Flood Risk Vulnerability and Flood Zone Compatibility

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Notes to table 3:

- This table does not show the application of the Sequential Test which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and Exception Tests do not need to be applied to minor developments and changes of use, except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

* In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

3.2 Site Specific NPPF Flood Risk Categorisation

3.2.1 To assess the NPPF flood risk classification for the site, the first step was to inspect the UK Government web based 'Flood Map for Planning' which is used to inform planning of a site's Flood Zone(s) and the probability of flooding from rivers or sea (not taking into account the presence of flood defences or climate change). However, the web based 'Long Term Flood Risk Assessment for Locations in England' should also be used to identify the long-term flood risks from rivers and seas, surface water and reservoirs.

3.2.2 The Flood Map for Planning report is enclosed in *Appendix E*, and it can be seen that the pre-development site and the surrounding area is located in an area classified as Flood Zone 1 (low probability of flooding from rivers or sea).

3.3 Site Specific Flood Zone Compatibility

3.3.1 The proposals for the development site are likely to fall within the following categories:

- Buildings used for industry

These types of development are classed as 'Less Vulnerable' development in the Flood Risk Vulnerability Classification, as per Table 2.

3.3.2 The site is located within Flood Zone 1, for which 'Less Vulnerable' development is deemed to be appropriate, and neither the sequential nor the exception test is required (refer to the Flood Zone compatibility table in the NPPF technical guidance).

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4.0 Hydrological Assessment

4.1 Sources of Flood Risk

4.1.1 This study assesses the risk from different types of flooding to the development and the risk of flooding from the development, taking into consideration climate change, as well as how flood risks should be managed. The approach to assessing flood risk at the development site was informed by the requirements of NPPF in conjunction with the client and Environment Agency requirements.

4.2 Fluvial Flooding (Rivers and Streams)

4.2.1 Flooding to the site from rivers and sea is indicated below in Figure 3, taken from the UK Government's Long Term Flood Risk Information.

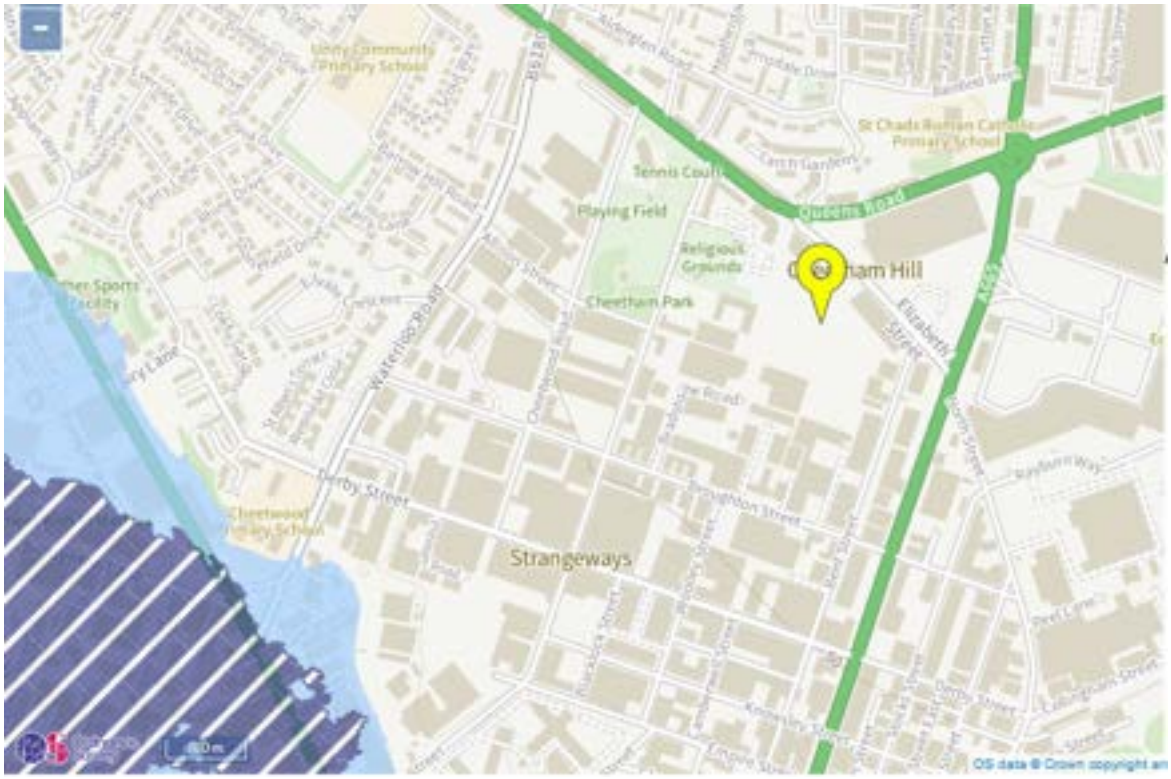


Figure 3: Long Term Flood Risk Assessment Map – Flood Risk from Rivers or Sea (© Crown Copyright)

4.2.2 It can be seen that the area within the existing site is at 'Very Low' residual risk from fluvial flooding. The site is not shown to be in an area which benefits from flood defences. The site has less than 0.1% chance of fluvial flooding each year (see Figure 4). Therefore, the proposed site is considered to be at very low residual risk from fluvial flooding.

Figure 4: Long Term Flood Risk Assessment (Detailed Information) – Flood Risk from Rivers or Sea (© Crown Copyright)



4.2.3 Although a lost watercourse is indicated as being located on site, based on the summary provided by in section 2.3.2, it is anticipated that the lost watercourse is unlikely to be on site. We therefore consider the risk form this source to be low.

4.3 Tidal Flooding (Coastal or Estuarine)

4.3.1 There is currently no flood risk identified on the Environment Agency flood maps for the site and it is therefore regarded to be at low risk from tidal flooding.

4.4 Reservoir Flooding

4.4.1 Reservoir flooding is extremely unlikely to happen and there has been no loss of life in the UK from reservoir flooding since 1925. The Environment Agency is the enforcement authority and ensures that reservoirs are inspected regularly, and essential safety work is carried out.

4.4.2 The Long-Term Flood Risk Assessment (Flood Risk from Reservoirs) map shows the largest area that might be flooded if a reservoir were to fail and release the water it holds (see Figure 5). Since this is a prediction of a worst-case scenario, it is very low risk that a reservoir flood would be this large.



Figure 5: Long Term Flood Risk Assessment Map – Flood Risk from Reservoirs (© Crown Copyright)

4.4.3 The site does not lie within the maximum extents of flooding due to reservoir breach; therefore, the site is considered to be at low risk from reservoir flooding.

4.5 Canal Flooding

4.5.1 The Rochdale Canal (Canal & River Trust) is approximately 550m south-east of the site. The Ashton Canal (Canal & River Trust) is approximately 760m south-east of the site. The Manchester Ship Canal (which is privately owned and maintained) is located approximately 600m west of the site.

4.5.2 The SFRA identifies that the Manchester Ship Canal is a canalised watercourse, and hence its flooding mechanisms have more in common with a watercourse than a typical canal. Therefore, the risks associated with flooding from the Manchester Ship Canal have been assessed as part of the Fluvial Flooding Risk. The other canals are identified as 'broad canals'.

4.5.3 The broad canals are identified in the SFRA as not generally posing a direct flood risk as they are a controlled water body. Therefore, the residual risk of canal flooding is usually associated with lower probability events such as overtopping and/or the breaching of embankments.

4.5.4 A lack of information results in an inability to quantify the risk of canal breach or overtopping but the Level 2 SFRA maps the areas at potential risk of flooding from all canal sources. The development site, and its vicinity, are not in a canal overtop hazard zone or a canal breach zone.

4.5.5 Given the above information, it is considered that there is low risk of canal flooding to the site.

4.6 Groundwater Flooding

4.6.1 The site is not shown to be within an area at risk of groundwater flooding according to the groundwater flooding map shown within the Manchester, Salford and Trafford SFRA.

4.6.2 During the Site Investigation works, groundwater was encountered in BH01 at 6m bgl, BH02 at 6.5m bgl, BH04 at 6m bgl and TP10 at 1.2m bgl. However, the Site Investigation report summarises that groundwater strikes within the site are considered to represent perched water and it is evident that a band of perched water is present circa 6-6.5m bgl. The report confirms at this stage that the potential for rebounding the natural groundwater table following cease of the historical clay pits on site can not be discounted.

4.6.3 Subsequently, groundwater levels were monitored during gas monitoring during May and June 2021. The monitoring confirms that water was encountered with BH01 and BH01 a t levels fluctuating between 5.36-5.95m bgl. See Figure 6.

Exploratory Hole Location	Installation Strata	Response Zone(s) (m bgl)	17/05/2021 Depth (mbgl)	04/06/2021 Depth (mbgl)	11/06/2021 Depth (mbgl)	17/06/2021 Depth (mbgl)
BH01	Made Ground	4 - 8	5.36	5.6	5.56	5.55
BH02	Made Ground	2 - 6	5.80	5.93	5.93	5.95
BH04	Made Ground	2 - 5	Dry	Dry	Dry	Dry
BH05	Made Ground	2-5	Dry	Dry	Dry	Dry

Figure 6: Extract from Site Investigation Table 6.9b – Groundwater Monitoring Results

4.6.4 The proposed site levels are not yet confirmed; however, it is likely that proposed ground levels will largely be set at or above existing ground levels and there are no proposals to include basements. Therefore, based on the recorded depths of the groundwater and the likelihood that this is perched water, the risk of groundwater flooding to the site is considered low.

4.6.5 It is recommended that external ground levels across the site should fall away from the proposed buildings and ensure that the creation of low points are avoided (other than those used intentionally for drainage features) in order that in the unlikely event of groundwater flooding, the flood water is safely routed away from the buildings on site.

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4.7 Public Sewers or Highway Drainage Flooding (Infrastructure Failure)

4.7.1 There is a combined public sewer which crosses the northern boundary of the site, however exact details of this sewer is not yet known. There are further public sewers in the wider vicinity of the site as described in section 2.2.

4.7.2 There are no highway drains recorded within the site boundary.

4.7.3 A pre-development enquiry has been issued to United Utilities, and they have not confirmed any historic flood events in their response.

4.7.4 The LLFA have also been consulted, and they have confirmed that they do not have any record of historic flooding at this location.

4.7.5 Providing United Utilities and Manchester City Council maintain their drainage assets in the vicinity of the site, the risk of flooding to the proposed redevelopment site from public sewers or highway drainage is considered as low.

4.8 Surface Water Flooding to the site

4.8.1 Surface water flooding can be caused when rainwater during extreme rainfall events does not drain away through the normal drainage system or soak into the ground with flooding occurring, principally from manholes and gullies. Surcharging sewers can result in overland flows which if originating at a higher elevation than a development site can potentially pose a flood risk.

4.8.2 From the UK Government's Flood Risk from Surface Water (extent of flooding) map;

- Where a site is located in a dark blue shaded zone, this indicates that the site is at high risk of flooding, where flooding occurs as a result of rainfall with a greater than 1 in 30 (3.3%) chance in any given year.
- Where a site is located in a mid-blue shaded zone, this indicates that the site is at medium risk of flooding, where flooding occurs as a result of rainfall of between 1 in 100 (1%) and 1 in 30 (3.3%) chance in any given year.
- Where a site is located in a light blue shaded zone, this indicates that the site is at low risk of flooding, where flooding occurs as a result of rainfall of between 1 in 1000 (0.1%) and 1 in 100 (1%) chance in any given year.
- Where a site is located in a clear (unshaded) area; this indicates that the site is at very low risk of flooding, where flooding occurs as a result of rainfall with less than 1 in 1000 (0.1%) chance in any given year.

4.8.3 The extent of flooding to the site from surface water is indicated in Figure 7 and it can be seen that the site is located in an area classified as being at 'Very Low' risk of flooding from surface water.

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4.8.4 There is an area at 'Low Risk' of flooding from surface water adjacent to the northwest of the site, running from Elizabeth Street and then south-east along Bent Street. This is likely due to limitations of the existing highway surface water drainage network, and in any case does not stray into the site boundary. Additionally, the topography around the site falls in a south direction which would therefore direct any surface water flooding away from the site.

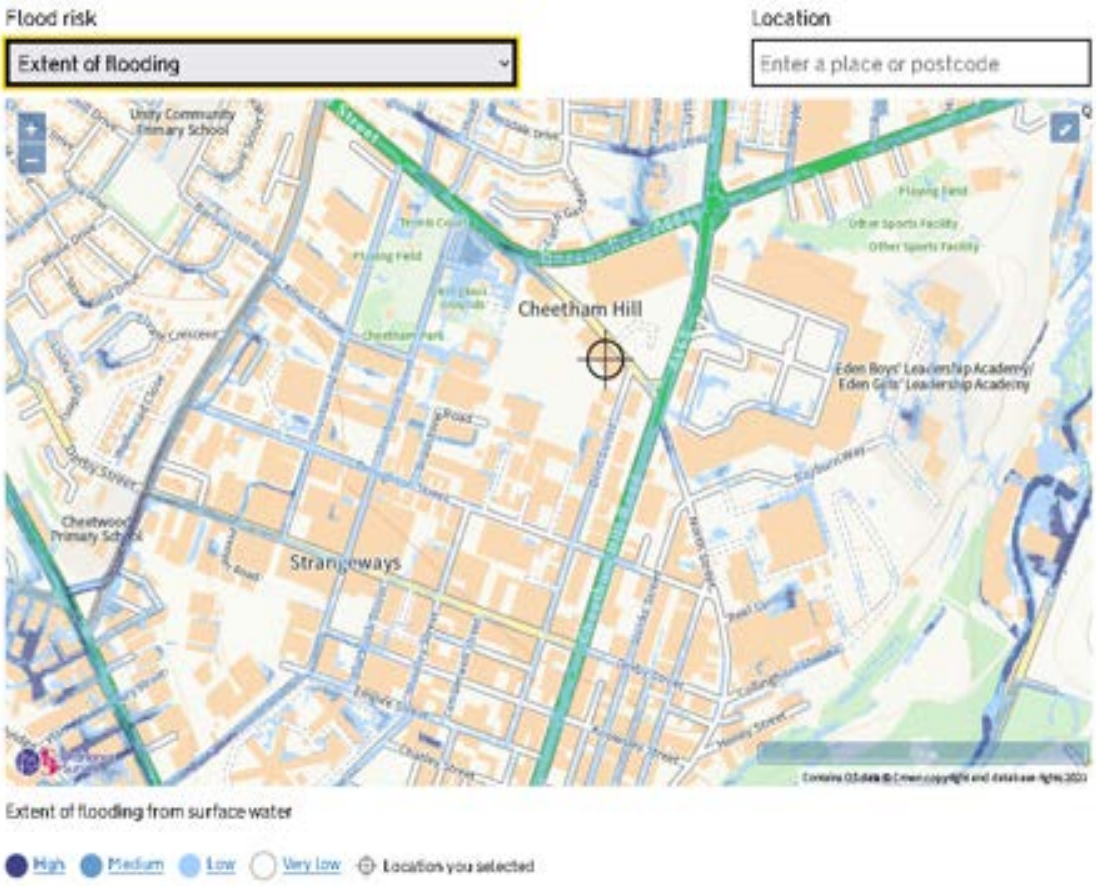


Figure 7: Risk of Flooding from Surface Water - Extent of Flooding

4.8.5

4.8.6 Considering the above information, the risk of surface water flooding to the site is considered very low. The area around the site is also generally identified as being at very low risk from surface water flooding, whilst surface water runoff from the 'low risk' areas to the north of the site would follow the topography around the site directing surface water from away from the site in a north-westerly direction. Therefore, the usual mechanisms by which surface water could pose a risk to the site (i.e. overland flow) are restricted. As such, no specific mitigation measures are required in order to mitigate against surface water flooding from outside of the site boundary. However, since the topography within the site boundary

is likely to be adjusted, and due to the site's location within a CDA, mitigation measures are proposed in Section 5 in order to account for the residual risk of surface water flooding to the site.

4.9 Surface Water Flooding from the site

4.9.1 Developers are responsible for ensuring that new development does not increase the flood risk elsewhere. Where new development is proposed, the proposed surface water drainage network shall be designed to not flood for the critical 1 in 30-year storm event and flood water generated up to the critical 1 in 100-year plus climate change storm event shall be constrained within areas on site so as not to cause damage to buildings, essential services or adjoining developments and services.

4.9.2 Although the development proposals do not indicate a significant change to the impermeable areas on the site, the development has the potential to increase flood risk where additional run-off from proposed roads, paved areas and building roofs are discharged freely into the downstream drainage network. It is therefore encouraged to propose permeable areas, landscaping areas and incorporate sustainable drainage features utilising infiltration or attenuation where possible.

4.9.3 The SFRA places the site within the Manchester Conurbation Core Critical Drainage Area (CDA). CDAs generally have local flooding problems associated with drainage, and are particularly sensitive to an increase in the rate of surface water runoff and/or volume from new development. Specific drainage requirements are required in these areas to help reduce local flood risk. The LLFA usually require that surface water discharge from new developments on brownfield sites must meet a 50% betterment or more, and that this must be calculated from the existing impermeable area of the site / capacity of the existing outfall from the site.

4.9.4 An assessment of the proposed surface flows is carried out within the drainage strategy within section 6 of this report.

4.10 Historical Flooding

4.10.1 Manchester City Council have been contacted to provide details of any historic flooding information / data for the site, and they have confirmed that they do not have record of any historic flooding in this location.

4.10.2 A Pre-Development Enquiry has been submitted to United Utilities, requesting information of any historic public sewer flooding events within the vicinity of the site. No historic flooding has been identified in their response.

4.11 Summary of Flood Risk

4.11.1 From the evidence collated and subsequent negotiations the main types of flooding that may apply to the proposed development site are as follows:

- Surface water flooding to the site (residual risk); and
- Surface water flooding from the site (potential).

5.0 Mitigation

5.1 Surface Water Flooding to the site Mitigation

5.1.1 The UK Government Long Term Flood Risk Assessment surface water flood maps indicate that the site is at very low risk of surface water flooding. However, the site topography is likely to be reprofiled as part of the development proposals, and the site is located within a CDA. Therefore, measures outlined in this section are recommended in order to ensure that the risk of surface water flooding to the post-development site shall not be increased.

5.1.2 Existing footway levels along the outside perimeter of the site are determined by the highway authority. It is recommended that these levels should be maintained, in order that surface water shall fall away from the site boundary and into the highway gullies. It is assumed that the highway drainage will be subject to the local highway authority regular drainage maintenance schedule.

5.1.3 It is recommended that proposed external ground levels across the site should fall away from the proposed buildings in a manner which does not create low points where water might collect unintentionally. This will ensure that any surface water will not flow towards the proposed buildings. The proposed surface water drainage network shall be designed to accommodate flows generated from within the site.

5.1.4 Providing the above measures are implemented the flooding risk to the development site from surface water is therefore considered low post development.

5.1.5 A detailed assessment of the proposed surface flows is carried out within the drainage strategy within section 6 of this report.

5.2 Surface Water Flooding from the site Mitigation

5.2.1 Developers are responsible for ensuring that new development does not increase the flood risk elsewhere. Any new development site drainage should be designed in accordance with current best practice to provide adequate capacity not to flood for the critical 1 in 30-year storm event and flood water generated from up to the critical 1 in 100-year plus climate change storm event shall be constrained within the areas on site so not to cause damage to buildings, essential services or adjoining developments & services.

5.2.2 The SFRA places the site within the Manchester Conurbation Core Critical Drainage Area (CDA). CDAs generally have local flooding problems associated with drainage and are particularly sensitive to an increase in the rate of surface water runoff and/or volume from new development. Specific drainage requirements are required in these areas to help reduce local flood risk. The LLFA usually require that surface water discharge from new developments on brownfield sites must meet a 50% betterment or

more, and that this must be calculated from the existing impermeable area of the site / capacity of the existing outfall from the site.

5.2.3 For sites, which are located within a CDA, the following guidance is provided in the SFRA User Guide:

- Development should aim for a minimum reduction in surface water runoff rates of 50% for Brownfield sites, with an aim of reducing runoff to Greenfield rates up to a 1 in 100-year storm event, considering climate change.

5.2.4 However, as the site appears to be largely undrained, with only small areas of Bricam Street currently positively draining and therefore the site is likely to be considered greenfield.

5.2.5 During consultation with United Utilities and Manchester LLFA, their requirement is to restrict proposed flow rates to the equivalent greenfield flow rates.

5.2.6 In February 2016, the Environment Agency released updated climate change allowances for peak rainfall intensities which should be applied to new developments. Table 4 demonstrates the climate change allowances with central and upper end allowances being considered.

5.2.7 Based on the nature of the development, a lifespan in excess of 60 years is anticipated. Therefore, the potential climate change allowance for 2070-2115 ranges between 20% for the central allowance and 40% for the upper end allowance. As such, the design will take into account up to 40% for climate change on peak rainfall intensity and will be considered in calculations.

Table 4: (Extract Environment Agency Guidance) Peak Rainfall Intensity Allowance in small and urban catchments

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

5.2.8 In following the standard hierarchy of drainage solutions, consideration should firstly be given to the discharge of surface water runoff by sustainable methods such as infiltration.

5.2.9 Section 6 reviews the surface water discharge options, and it is proposed (in accordance with United Utilities Pre-Development Enquiry response) that the surface water will outfall into the public combined sewers adjacent to the north of the site (subject to a Section 106 Agreement with United Utilities) via a new connection at a maximum pass forward rate of 11 l/s.

5.2.10 To minimise localised flooding within the site, the drainage design should ensure that gullies, drainage channels and drains are all suitably sized to accommodate peak storm flows. Also, all inlet features should have suitably sized sumps to catch silts and should be subject to a documented routine maintenance and cleansing regime.

5.2.11 Flood water exceedance routes should be identified, both on and off site.

5.2.12 For any sustainable drainage systems employed in the development, an appropriate management and maintenance plan for the sustainable drainage system for the lifetime of the development should be submitted which should include:

- Any arrangements for adoption by an appropriate public body or statutory undertaker, management and maintenance by a Residents' Management Company
- Arrangements concerning appropriate funding mechanisms for its on-going maintenance of all elements of the sustainable drainage system (i.e. inspections, regular maintenance)
- Means of access for maintenance and easements where applicable

5.2.13 Assuming that the proposed drainage system is designed to provide adequate capacity, and that the private and adopted sewers will be maintained by their adopted authority, it can be assumed risk of flood from blockage or overloading is minimal.

5.2.14 The final design of the drainage networks shall be in accordance with the legislation set by the Environment Agency, Manchester City Council, and United Utilities.

6.0 Drainage Strategy

6.1 Existing Drainage

6.1.1 The public sewer records have been obtained for the development site, and are enclosed in *Appendix B*.

6.1.2 The public sewer records indicate that the following public sewers are recorded within the site:

- A 225mm combined sewer crosses the site access, located to the rear of the existing properties fronting onto Elizabeth Street. The sewer appears to flow in a west to east direction however, there are no accessible locations within the site or in public accessible land and therefore the existing position, size, depth and condition is unknown. Further works will therefore be required to establish the sewer status which will require access into a third-party land or agreement with United Utilities to carry out slip trenches across the sewer as it crosses the site to confirm its alignment.

6.1.3 The public sewer records indicate that the following public sewers are located within the vicinity of the site:

- A 400x450mm combined public sewer is located north of the development site, within Elizabeth Street and appears to flow in a north-westerly direction. Based on the sewer record information it appears that the sewer has a nearby bifurcation (UU MH2205) that separates the flows in Elizabeth Street in both direction along the road. The sewer divides the flows to go into separate lines at Bent Street (east) and Sherborne Street (west).
- The 225mm sewer noted above (within the site) flows east towards the sewer in Bent Street.
- Southwest of the site there is a 375 public combined sewer at Bradstone Road, and also a 375mm combine line in Broughton Street. Both of these flow to the west and join with the main combined sewer at Sherborne Street.

6.1.4 There are further public sewers identified on the public sewer records within the wider vicinity of the site, but these are not considered relevant to the scheme.

6.1.5 A GPR Utilities Survey has been carried out and is enclosed in *Appendix C*.

6.1.6 A CCTV Drainage Survey has also been carried out and is enclosed in *Appendix D*.

6.1.7 The GPR/CCTV drainage surveys have identified the following:

- The surveyor completed a walk over site and did not identify drainage within the site boundary except of one chamber located within the north-east of the site. The manhole was not noted on the topographical survey; however, the manhole was full of debris and therefore no access could be made to trace any upstream or downstream connections and is likely to be redundant.

- The 225mm combined public sewer immediately north of the site, which crosses through the site boundary was attempted to be surveyed, however all access points were located within privately owned land to the properties fronting on to Elizabeth Street and therefore this sewer was unable to be surveyed.
- The 400 x 450mm combined public sewer within Elizabeth Street was attempted to be surveyed from various access points along the sewer. Due to high water levels in the sewer, the survey was unable to be completed, however a manhole card (Ref 2203) was recorded, which indicates that the invert level is approximately 53.080m AoD and confirms the main sewer is 450 x 400mm brick construction.

6.1.8 The site has previously been used as residential and commercial properties, and as such has existing private drainage features are likely to exist within the site, however as the site is heavily overgrown, drainage features have not yet been identified, however it is anticipated that existing drainage is likely to be redundant. It is recommended that drainage is recorded and confirmed with the Engineers once site strip works are being completed.

6.1.9 It is recommended that a further survey is completed once access can be made available to the rear of the properties on Elizabeth Street. The survey is required to confirm the size, condition, location, and depths of the existing public sewer – specifically where it crosses the site boundary so the sewer can be adequately protected throughout development and so proposed designs can be co-ordinating with the sewer position.

6.1.10 Once the existing public sewer location on site is known, the legal easement of 6m – 3m either side of the sewer should be projected onto the site layout to confirm proposals within the easement strip.

6.1.11 The existing sewer on site will require protecting throughout development works.

6.2 Proposed Foul Water Drainage

6.2.1 A separate foul and surface water system is proposed.

6.2.2 The foul drainage created by the post-development site is proposed to be collected by new foul drains which will connect into the existing combined public sewer in Elizabeth Street.

6.2.3 The invert level of the public combined sewer at the existing manhole adjacent to the north of the site is confirmed as approximately 53.080m AoD (Layer Surveys Manhole Card depth). it is assumed at this stage that the public combined sewer is deep enough to accept a fully gravity drainage system from the proposed development based on setting minimum ground levels on site to 55.900m AoD. However as proposed levels have not been finalised, any future levels should consider the gravity potential and if necessary, a pumped solution may be required.

6.2.4 Proposed Flows have not yet been determined from the development site, however these will be confirmed through design development.

6.2.5 A Pre-Development Enquiry has been submitted to United Utilities, and they have confirmed that foul will be allowed to drain to the public combined sewer network at an unrestricted rate. The connection to the public sewer can be at any convenient point.

6.2.6 A connection to the public sewer will be subject to a Section 106 Agreement with United Utilities.

6.2.7 The Proposed Drainage Strategy - Foul is enclosed in *Appendix G.*

6.3 Proposed Surface Water Drainage

6.3.1 Any new development site drainage should be designed in accordance with current best practice to provide adequate capacity not to flood for the critical 1 in 30-year storm event and flood water generated for up to the critical 1 in 100-year plus climate change storm event shall be constrained within the areas on site so not to cause damage to buildings, essential services or adjoining developments and services.

6.3.2 In following the standard hierarchy of drainage solutions, consideration should firstly be given to the discharge of surface water runoff by sustainable methods such as infiltration.

Infiltration

6.3.3 Made Ground is likely to be present to a significant depth, based on the historic use of the site therefore, infiltration is not considered to be a viable solution.

Watercourse

6.3.4 No above ground watercourses have been identified within the proposed site or in the immediate vicinity of the site, with the exception of the recorded ‘lost’ watercourse, which investigations have not identified on site. Connection to the nearest known watercourse would require across numerous third-party land, therefore, discharge to watercourse is not considered to be a viable option.

Surface Water Sewer

6.3.5 There are no surface water sewers identified within the vicinity of the site.

Combined Water sewer

6.3.6 There are various existing combined public sewers within the vicinity of the development site, as described in section 2.3 and 6.1, therefore connection to the existing combined public sewer system is considered viable.

6.3.7 Table 5 summarises the options for surface water disposal:

Table 5: Surface Water Disposal

Surface Water Disposal	Potential	Description
Infiltration	✗	Made Ground is likely to be present to a significant depth, based on the historic use of the site therefore, infiltration is not considered to be a viable solution.
Watercourse	✗	Discharge to watercourse is not considered to be a viable option.
Surface Water Public Sewer	✗	There are no surface water sewers identified within the vicinity of the site.
Combined Public Sewer	✓	There are various existing combined public sewers within the vicinity of the development site, therefore connection to the existing combined public sewer system is considered viable.

6.3.8 The proposed drainage network is therefore proposed to discharge via a new connection into the existing combined public sewer within Elizabeth Street at a restricted rate.

6.3.9 The invert level of the public combined sewer at the existing manhole adjacent to the north of the site is confirmed as approximately 53.080m AoD (Layer Surveys Manhole Card depth). it is assumed at this stage that the public combined sewer is deep enough to accept a fully gravity drainage system from the proposed development based on setting minimum ground levels on site to 55.900m AoD. However as proposed levels have not been finalised, any future levels should consider the gravity potential and if necessary, a pumped solution may be required.

6.3.10 It is recommended that proposed rates are restricted to a maximum of 11 l/s based on the equivalent greenfield flow rates for the site area as confirmed by United Utilities and Manchester LLFA.

6.3.11 United Utilities have confirmed that surface water can discharge into the public surface water sewer at a maximum pass forward rate of 11 l/s.

6.3.12 The Manchester LLFA and United Utilities correspondence is enclosed in Appendix F.

6.4 Sustainable Drainage Considerations

6.4.1 In accordance with the National Planning Policy Framework (NPPF) a sustainable drainage system (SuDS) should be provided unless demonstrated to be inappropriate. The following options have been considered for the site:

Infiltration Systems:

6.4.2 Systems such as infiltration trenches and soakaways were considered as part of the surface water management strategy however, the ground conditions indicate significant depths of made ground across the site. Therefore, infiltration systems are not considered suitable for the site.

Green/Blue roofs:

6.4.3 Green/Blue roofs were considered for the site however, found not viable due to roof areas being utilised for Photovoltaic (PV) panels or rooflights.

Swales, Wetlands and Attenuation Ponds:

6.4.4 Due to the nature of the site and the limited space available, pre-treatment steps and retention systems such as swales, wetlands and ponds are not considered suitable for the site due to their space requirements.

Permeable Paving

6.4.5 Permeable paving was considered across the site, however due to the heavy loading from HGV use and their likely turning requirements, permeable paving would need to be restricted to low loading areas. However, when considering the reduced space, in co-ordination with proposed services the permeable paving did not provide significant volume retention to achieve the necessary greenfield flow restriction given the large area of site.

Rain Gardens and Drained Soft Landscaping

6.4.6 It is currently proposed to include localised rain gardens which will locally drain external paved areas. Further co-ordination of the detail and capacity is required with the Landscape Architect.

SuDS Conclusion

6.4.7 The development is proposing potential options to include areas drained soft landscaping and rain gardens.

6.4.8 Attenuation volumes are estimated at 1300m³, however a detailed model of the drainage system has been generated to confirm the system capacity and co-ordinate space requirements within the site. The required volumes are estimated to be approximately 1000m³ within attenuation tanks and some localised volume provision within oversized pipework.

6.4.9 Surface water run-off from hard paved areas at risk of contamination should receive water quality treatment. Sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, or used are consider high hazard in terms of contamination. Figure 8 illustrates the pollution hazard indices for different land use classifications from The CIRIA SuDS Manual C753 (2015).

Figure 8: Pollution Hazard Indices for Land Use Classification (Table 26.2 the CIRIA SuDS Manual 2015)

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
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[1]	Medium	0.7	0.6	0.7
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; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

6.4.10 Figure 9 illustrates the SuDS Component mitigation indices from The CIRIA SuDS Manual C753 (2015).

Figure 9: Indicative SuDS Mitigation Indices (Table 26.3 the CIRIA SuDS Manual 2015)

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[4]	0.7	0.5
Wetland	0.8[4]	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.

6.4.11 The selection of treatment should ensure that the SuDS mitigation component index (Figure 9) exceeds the pollution hazard index (Figure 8). Treatment could be provided using a combination of sustainable methods. Where two stages of treatment are required, the second stage of treatment should account for reduced performance due to lower inflows; therefore 0.7 (mitigation index) should be used.

6.4.12 The proposed development is likely to require treatment systems therefore due to the limited SuDS opportunities on site it is proposed to drain via petrol interceptors prior to discharge off site.

6.4.13 The proposals for pollution protection should be agreed with Manchester City Council.

6.4.14 The Proposed Drainage Strategy is enclosed in *Appendix G.*

6.4.15 The final design of the drainage networks shall be in accordance with the legislation set by the Environment Agency, Manchester City Council, and United Utilities.

6.5 Maintenance

6.5.1 A suitable maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.

6.5.2 It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event. Significant sediment deposition is likely in areas used for storage, so a post clean-up operation may be required including the removal of litter, vegetation, sewerage debris and larger objects.

6.5.3 A management company may be required for maintenance of attenuation facilities.

Appendix A

Proposed Site Layout

Schedule of Areas

	GIA		GEA	
Unit 1	3,400 sqft	316 sqm	3,824 sqft	355 sqm
Total	**3,400 sqft**	**316 sqm**	**3,824 sqft**	**355 sqm**
Unit 2	14,000 sqft	1,301 sqm	14,680 sqft	1,364 sqm
FF Office @10%	1,400 sqft	130 sqm	1,532 sqft	142 sqm
Total	**15,400 sqft**	**1,431 sqm**	**16,212 sqft**	**1,506 sqm**
Unit 3	20,500 sqft	1,904 sqm	21,463 sqft	1,994 sqm
FF Office @10%	2,050 sqft	190 sqm	2,181 sqft	203 sqm
Total	**22,550 sqft**	2,905 sqm	**23,644 sqft**	2,197 sqm
Unit 4	4,844 sqft	450 sqm	5,206 sqft	484 sqm
Mezzanine	1,086 sqft	101 sqm	1,214 sqft	113 sqm
Total	**5,930 sqft**	**551 sqm**	**6,420 sqft**	**596 sqm**
Unit 5	4,844 sqft	450 sqm	5,080 sqft	472 sqm
Mezzanine	1,086 sqft	101 sqm	1,185 sqft	110 sqm
Total	**5,930 sqft**	**551 sqm**	**6,265 sqft**	**582 sqm**
Unit 6	7,000 sqft	650 sqm	7,311 sqft	679 sqm
Mezzanine	1,569 sqft	146 sqm	1,705 sqft	158 sqm
Total	**8,569 sqft**	**796 sqm**	**9,016 sqft**	**838 sqm**
Unit 7	5,500 sqft	511 sqm	5,813 sqft	540 sqm
Mezzanine	1,249 sqft	116 sqm	1,357 sqft	126 sqm
Total	**6,749 sqft**	**627 sqm**	**7,170 sqft**	**666 sqm**
Unit 8	5,500 sqft	511 sqm	5,974 sqft	555 sqm
Mezzanine	1,249 sqft	116 sqm	1,395 sqft	130 sqm
Total	**6,749 sqft**	**627 sqm**	**7,369 sqft**	**685 sqm**
Unit 9	11,000 sqft	1,022 sqm	11,743 sqft	1,091 sqm
FF Office@10%	1,100 sqft	102 sqm	1,231 sqft	114 sqm
Total	**12,100 sqft**	**1,124 sqm**	**12,974 sqft**	**1,205 sqm**
TOTAL	**87,377 SQFT**	**8,118 SQM**	**92,893 SQFT**	**8,630 SQM**
SITE AREA	**4.9 ACRES**	**20,000 SQM**		
DENSITY		**40.6%**		

Parking Allocation

	Cycle Spaces	Sheffield Hoops	Car Parking EV	DDA	Standard
Unit 1	6	3	/	1	3
Unit 2	10	5	6	1	13
Unit 3	10	5	4	1	14
Unit 4	2	1	1	1	2
Unit 5	2	1	1	1	2
Unit 6	4	2	/	1	5
Unit 7	4	2	1	1	4
Unit 8	4	2	1	1	4
Unit 9	8	4	4	1	12
Total	**50**	**25**	**18**	**9**	**59**



0 10m 25m
1:500

Proposed Site Plan
1 : 500

General Notes

Do not scale from this drawing. Only work to written dimensions.

All site dimensions shall be verified by the Contractor on site prior to commencing any works.

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PLANNING

- Development Site Boundary *(Site Area: 4.9 Acres)*
- Tree to be removed
- Tree Root Protection Area/ Tree to be retained
- Paladin Fencing
- Concrete finish in Service Yard
- Tarmac Finish
- Linear Flag Paving to Main Footpaths & Car Parking
- Soft Landscaping

Also refer to Landscape Architect's Design for further details

Rev.	Description	Date	ISS	APP
P1	Issued for Planning	21.01.22	NP	

Scale: As indicated @ A1
Status: Planning
Drawn By: NP
Checked By: BB
Date: January 2022

Client:
Kier Property

Project:
Elizabeth Street, Cheetham Hill Manchester

Sheet Name:
Proposed Site Plan

Project No. Orig. Zone Level Type Role Cls Dwg No. Rev
21039-FRA-XXXX-DR-A-10-0003-P1

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Appendix B

Public Sewer Records

United Utilities
Water for the North West

How to contact us:

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

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

Curtins Consulting Ltd

51-55
Tithebarn Street,
Liverpool,
L2 2SB

FAO:

Your Ref: P080139 PO No. ICMA563
Our Ref: UUPS-ORD-339684
Date: 29/10/2021

Dear Sirs

Location: Elizabeth Street Cheetham

I acknowledge with thanks your request dated 28/10/2021 for information on the location of our services.

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

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

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

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

If you have any queries regarding this matter please contact us .

Yours Faithfully,

Karen McCormack
Property Searches Manager

United Utilities Water Limited
Registered In England & Wales No. 2366678
Registered Office Haweswater House, Lingley Mere Business Park,
Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

United Utilities

Water for the North West

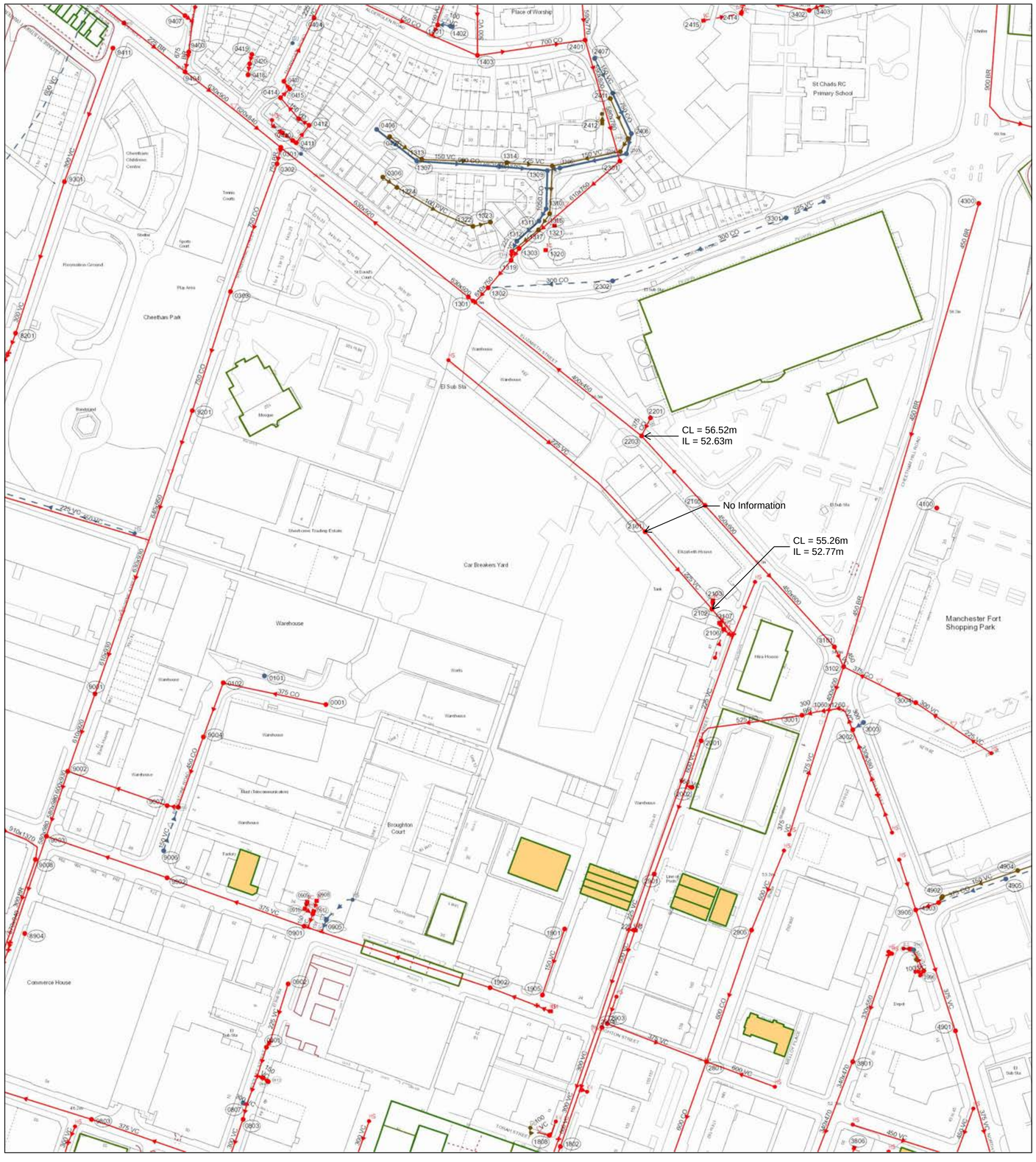
TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

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

TERMS AND CONDITIONS:

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

United Utilities Water Limited
Registered In England & Wales No. 2366678
Registered Office Haweswater House, Lingley Mere Business Park,
Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP



Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
4902	54.7	FO	52.1	150			VC	3.926549	1 in 16
2105	56.15	CO	53.47	400			BR	52.28177	1 in 63
1312	56.85	SW	53.45	225			VC	6.435156	1 in 72
2411	59.04	SW	56.04	750			CO	24.65848	1 in 247
1314	57.66	FO	53.93	225			VC	25.32591	1 in 281
3907		CO		150			VC	4.283729	
0407	56.74	FO	54.58	150			VC	21.71614	1 in 136
2201		CO	0	375			CO	11.18034	
1306	58.02	SW	55.71	225			VC	7.111567	1 in 142
2410	58.7	FO	56.18	150			VC	8.268784	1 in 118
2408	58.71	SW	55.94	750			CO	11.52477	1 in 192
0912		CO		150			VC	8.040379	
2409	59.03	FO	56.34	150			VC	24.21166	1 in 151
0406	56.7	SW	54.18	900			CO	28.22433	1 in 282
0414		CO		150			VC	6.894876	
0415		CO		150			VC	5.261834	
2303	58.56	SW	55.88	750			CO	37.72635	1 in 222
0410		CO		150			VC	2.220056	
1303		CO	0	610			BR	7.941139	
1324		FO		100			PVC	47.50373	
0413		CO		150			VC	15.42992	
1315	57.94	FO	53.84	225			VC	26.57863	1 in 204
4904	54.65	FO	52.42	150			VC	44.18269	1 in 138
0306		CO		100			PVC	9.595848	
9405	56.28	CO	52.39	225			BR	43.41659	1 in 32
2304	58.56	FO	56.11	150			VC	38.47259	1 in 110
9404	56.08	CO	51.02	630			BR	34.20526	1 in 428
0409		CO		150			VC	7.282881	
1313	57.07	FO	54.42	150			VC	47.27432	1 in 103
0403	56.36	CO	54.74	225			VC	38.95205	1 in 156
1307	57.03	SW	54.08	900			CO	45.75411	1 in 158
1317	57.28	FO	53.62	225			VC	19.11055	1 in 87
0411		CO		150			VC	12.24889	
1309	57.93	SW	53.7	1050			CO	21.30391	1 in 304
0412		CO		150			VC	6.743621	
0404	56.95	CO	54.49	225			VC	18.9646	1 in 61
4905	54.65	SW	52.6	375			CO	39.59217	1 in 53
1311	57.34	SW	53.6	1050			CO	16.5009	1 in 110
1322		FO		100			PVC	9.898246	
2407	59.06	SW	57.34	150			VC	21.84976	1 in 17
1308	57.63	SW	53.75	1050			CO	26.88994	1 in 538
4903	54.6	FO	51.85	375			CO	13.27087	1 in 7
9006	50.66	SW	49.08	150			VC	12.64911	1 in 141
2203	56.52	CO	52.63	400			BR	118.5765	
1316	57.45	FO	53.71	225			VC	10.88204	1 in 121
1310	57.53	SW	53.63	1050			CO	7.972166	1 in 266
1318	56.59	CO	53.36	225			VC	4.954495	1 in 248
9001	51.17	CO	48.56	610			BR	45.54119	1 in 34
0001	51.51	CO	49.14	375			CO	58.24946	1 in 108
9803	48.25	CO	45.06	375			VC	77.15124	
9004	51.17	CO	48.43	450			CO	41.4367	1 in 159
4300	60.1	CO	55.22	450			BR	267.72	1 in 46
2904	53.1	CO	45.29	600			VC	69.89278	1 in 74
1319	56.35	CO	51.46	610			BR	19.62076	1 in 98
9403	56.07	CO	51.15	675			BR	5.09902	1 in 85
9002	50.61	CO	47.19	600			BR	18.97367	1 in 105
3101	54.87	CO	50.18	450			VC	12.08305	1 in 16
1402	56.34	SW	57.59	100			VC	4.123106	1 in 37
1802	52.22	CO	44.32	600			VC	68.94926	1 in 82
3004	54.43	CO	50.3	300			VC	22.36068	1 in 51
2801	52.78	CO	48.01	600			CO	65.78754	1 in 52
3905	54.55	CO	49.92	375			VC	70.59293	1 in 84
8201	52.75	CO	49.04	300			VC	11.7047	
0102	51.4	CO	48.58	450			CO	31.95309	1 in 246
3001	55.17	CO	48.06	525			CO	60.83479	1 in 135
0807	49.39	SW	0	300			VC	2.236068	
4901	53.85	CO	49.06	375			VC	116.4818	1 in 85
9411	55.91	CO	52.18	300			VC	78.77182	1 in 50
1901		CO		150			VC	38.67003	
9007	50.87	CO	48.09	450			CO	58.18935	1 in 216
1403	58.14	CO	53.84	750			CO	29.102	1 in 416
3906		CO		150			VC	13.96733	
3102	54.95	CO	49.33	400			BR	25.29822	
9003	50.27	CO	46.83	570			BR	62.29767	
1902	52.92	CO	49.55	375			VC	108.4666	1 in 83
3003	54.37	SW	0	150			VC	7.211102	
2401	59.01	CO	53.61	590			BR	32.61613	1 in 53
2105	56.15	CO	0	450			BR	106.2079	
3801	53.27	CO	47.9	340			BR	83.57033	1 in 56
2101		CO	0	225			VC	56.72742	
0803	49.42	CO	46.14	300			VC	27.51363	
2102	55.26	CO	52.77	225			VC	18.43909	
0801	49.61	CO	46.44	300			VC	16.76305	
3402	58.64	CO	55.26	375			VC	36.50257	1 in 126
9201	54.19	CO	49.21	750			CO	37.94733	1 in 105
3301	58.29	SW	56.39	300			CO	102.1812	1 in 71
2903	53.08	CO	48.07	375			VC	58.87275	1 in 1472
1301	56.06	CO	50.95	630			BR	133.0601	
2001	53.54	CO	47.58	600			VC	78.45034	1 in 68
0303	55.09	CO	49.9	750			CO	69.26038	1 in 103
2905	53.43	CO	48.89	600			CO	77.16217	1 in 90
9902	50.69	CO	47.52	375			VC	70.83784	1 in 112
9301	54.25	CO	50.57	300			VC	88.23265	1 in 58
3403	58.76	CO	55.87	300			VC	7.615773	1 in 32
0420		CO		100			VC	6.178284	
3002	54.12	CO	48.93	300			VC	10.77033	
0419		CO		100			VC	5.31208	
0301	56	CO	50.83	620			BR	4.123106	1 in 69
2901	53.14	CO	46.4	600			VC	89.81091	1 in 82
9407	56.16	CO	54.46	225			VC	5	1 in 6
9008	50.2	CO	36.21	300			BR	45.54119	
2002	53.41	CO	51.63	150			VC	3.162278	
1302	56.19	CO	51.24	610			BR	11.10132	
2302	57.07	SW	54.93	300			CO	69.07133	1 in 71
9005	50.82	CO	48.15	450			CO	6.082763	1 in 152
0901	51.58	CO	48.23	375			VC	80.65358	1 in 117
2301	58	CO	52.38	610			BR	39.68068	
0811	49.67	CO	0	300			VC	3.162278	
0902	50.88	CO	48.05	225			VC	33.52811	
0302	55.89	CO	50.69	750			CO	75.61085	1 in 98
0812		CO	0	150			VC	3.605551	

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad

LEGEND

Abandoned · Foul · Surface Water · Combined

- Public Sewer
- Private Sewer
- Section 104
- Rising Main
- Sludge Main
- Overflow
- Water Course
- Highway Drain

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

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

MANHOLE FUNCTION

FO	Foul
SW	Surface Water
CO	Combined
OV	Overflow

SEWER SHAPE

CI	Circular	TR	Trapezoidal
EG	Egg	AR	Arch
OV	Oval	BA	Barrel
FT	Flat Top	HO	HorseShoe
RE	Rectangular	UN	Unspecified
SQ	Square		

SEWER MATERIAL

AC	Asbestos Cement
BR	Brick
PE	Polyethylene
RP	Reinforced Plastic Matrix
CO	Concrete
CSB	Concrete Segment Bolted
CSU	Concrete Segment Unbolted
CC	Concrete Box Culverted
PSC	Plastic / Steel Composite
GRC	Glass Reinforecd Plastic
DI	Ductile Iron
PVC	Polyvinyl Chloride
CI	Cast Iron
SI	Spun Iron
ST	Steel
VC	Vitrified Clay
PP	Polypropylene
PF	Pitch Fibre
MAC	Masonry, Coursed
MAR	Masonry, Random
U	Unspecified

Address or Site Reference:

Elizabeth Street Cheetham,

Scale: 1:1250 **Date:** 29/10/2021

Sheet: 1 of 1

Printed by: Property Searches

SEWER RECORDS

United Utilities
Water for the North West

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

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Appendix C

Topographical Survey

Underground Utility Survey

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N

PLAN GRID NORTH

File Name: S22909-T.dwg

LEGEND

AV	AIR VALVE	LBY	LIFEBUOY
BB	BELISHA BEACON	MH	MANHOLE
BH	BOLLARD	MP	MOORING POST
BH	BORE HOLE	MS	MILE STONE
BM	BM	MP	MOORING POINT
BS	BENCH MARK	OH	OVER HEAD CABLES
BS	BUS STOP	OP	OUTFALL PIPE
BT	BT INSPECTION COVER	PB	POST OFFICE BOX
CCTV	CCTV CAMERA	PP	POLE
CCTV	CCTV CAMERA POST	PP	PETROL PUMP
CH	CATCH PIT	RE	RE
COM	COMMUNICATIONS COVER	RE	RODDING EYE
CP	CABLE POST/JUNCTION	RL	ROOF LEVEL
CTC	CABLE TV CONTROL	RS	ROAD SIGN
DC	DRAINAGE CHANNEL	RTW	RETAINING WALL
DP	DOWN PIPE	SP	SOIL VENT PIPE
DR	DRAIN	SAT	SATELLITE
EIC	ELEC. INSPECTION COVER	SNP	NAME PLATE
EL	ELECTRIC	SP	SIGN POST
ELB	ELECTRIC BOX	SW	SOFFIT LEVEL
ER	EARTH ROD	TV	STOP VALVE
FB	FLOWER BED/ POLE	TB	TELEPHONE BOLLARD
FL	FINISHED FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FP	FLAG POLE/ MARKER	TL	TRAFFIC LIGHT
FV	FUEL VENT	TL	TRAFFIC LIGHT
G	GULLY	TM	TRAFFIC MANHOLE
G.L	GROUND LEVEL	TP	TELEGRAPH POLE
GP	GATE POST	TP	TELEGRAPH POLE
GV	GAS VALVE	TR	TREE
GW	GAS VALVE	WM	WATER METER
IC	INSPECTION COVER	WO	WASH OUT
LP	LAMP POST	WT	WATER TANK TAP
PO	KERB OUTLET	WSV	WATER STOP VALVE
LAD	LADDER	03.84	TREE GIRTH (Dia.)
LD	LAMP DOWN	WS	TREE MULTI-GIRTH
LP	LAMP POST		

PAL	PALISADE		DRIP LINE
W.W	WIRE MESH		EDGE COURSE
R.W	RAILWAY WIRE		KERB
C.W	CONC PANEL		PATH
C.W	CONC. RAILING		SURFACE CHANGE
P.W	POST AND RAIL		TOP
T.W	IRON RAIL		TOP BANK
W.F	WIRE REINFORCED		BOTTOM BANK
CL(1)	CHAIN LINK		BUILDING
CL(2)	CHAIN LINK		BUILDING CANOPY
(34.28)	TOP OF FEATURE		OVER HEAD ELECTRICAL
(34.28)	TOP OF		OVER HEAD TELECOM
	STATION		
	BOREHOLE		HEDGE
	BATTER		

NOTES:
All levels relate to O.S (Newlyn) Datum, Established using network RTK.
Survey plotted on a plane local grid, orientated to National Grid.

SURVEY STATIONS

Name	Easting	Northing	Height
SEP1	384104.997	400210.632	56.328
SEP2	384221.597	400241.538	56.552
SEP3	384180.157	400272.489	56.321
SEP4	384139.633	400303.440	56.091
SEP5	384208.632	400341.046	56.401
SEP6	384178.141	400414.075	55.959
SEP7	384137.691	400445.026	55.722
SEP8	384117.231	400515.091	55.722
SEP9	384243.322	400554.704	55.950
SEP10	384322.212	400512.363	55.779
SEP11	384218.812	400508.812	55.754
SEP12	384214.514	400482.514	55.825
SEP13	384104.586	400182.784	54.825
SEP14	384103.868	400167.338	54.281

0 2m 4m 8m 12m 16m
SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

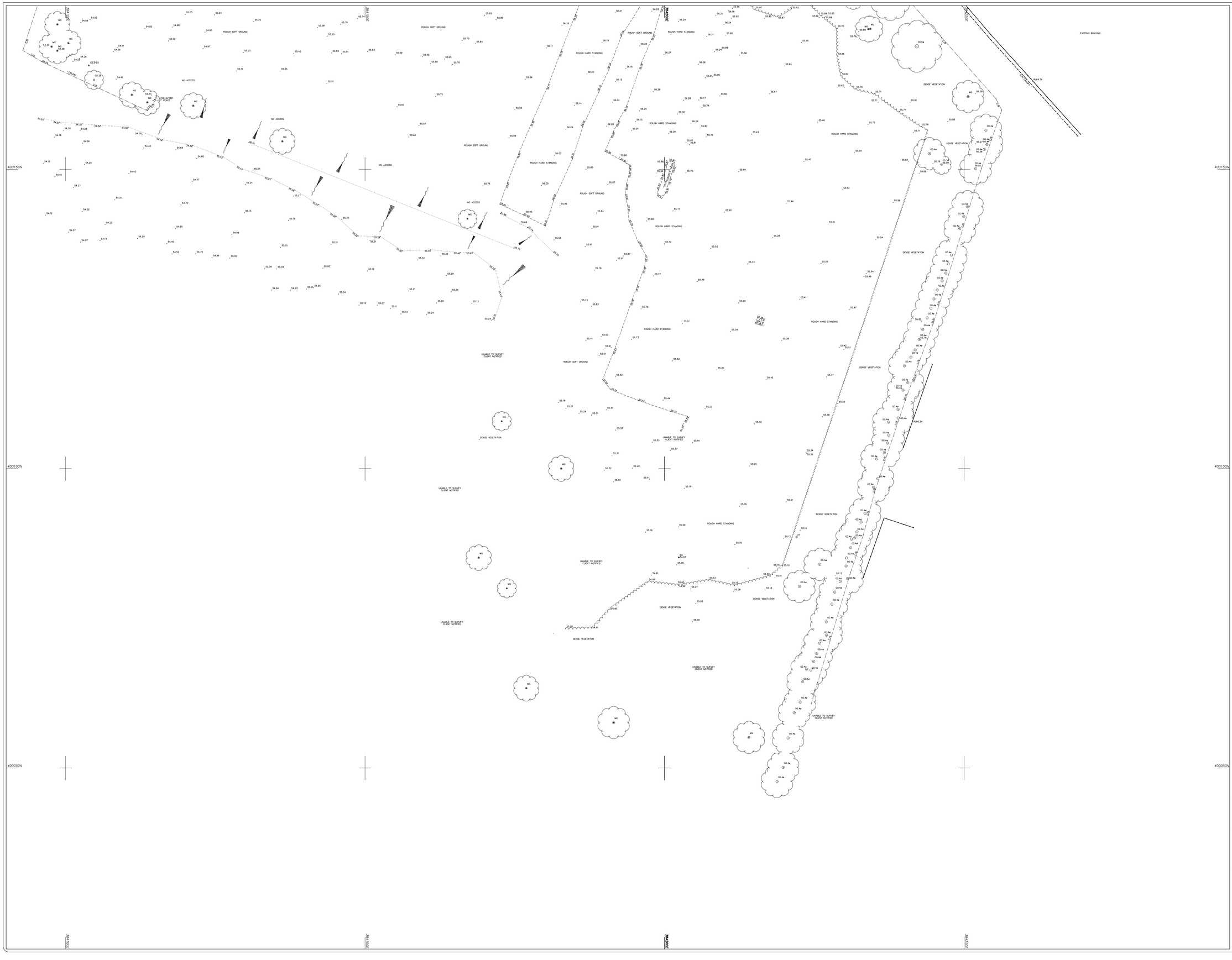
Client
Fletcher-Rae (UK) Limited.
Hill Quays
5 Jordan Street
Manchester
M15 4PY

Project Title
Topographical Survey of Land at:
Elizabeth Street
Cheetham Hill
M8 8JJ

Surveyed	Drawn	Checked
I.Bryning	B.Carr	R.Critchley

Scale	Date	Drawing Ref.	No.	Size	Rev
1:200	Oct 21	S22909-T	01	A0	–

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N

PLAN GRID NORTH

File Name: S22909-U.dwg

LEGEND

AC	AIR VALVE	BT	BT
BT	BT INSPECTION COVER	BT	BT STAT RECORD
CB	CONTROL BOX	CAB	CABLE DUCT
CBT	CONTROL BOX POST	CAB	CABLE DUCT STAT RECORD
COM	COMMUNICATIONS COVER	CAT	CABLE TV
CTY	CABLE TV COVER	CAT	CABLE TV STAT RECORD
DM	DRAINAGE MANHOLE	CO	COTS
DP	DOWN PIPE	CO	COTS STAT RECORD
EB	ELEC BOX	CO	COTS DUCT
EIC	ELEC INSPECTION COVER	CO	TELECOMS STAT RECORD
ELP	ELECTRICITY POLE	E	EARTH ROD STAT RECORD
EP	EARTH ROD	E	EARTH ROD STAT RECORD
EP	ELECTRICITY POLE	E	ELECTRIC
FCL	FENCE CROSSING LEVEL	E	ELECTRIC STAT RECORD
FH	FIRE HYDRANT	FO	FIBRE OPTICS
G	GULLY	FO	FIBRE OPTICS STAT RECORD
GLT	GROUND LIGHT	F	FUEL LINE
GST	GAS TAP	F	FUEL LINE STAT RECORD
GV	GAS VALVE	F	SIGNAL LINE
IC	INSPECTION COVER	M	MAINS GAS
IL	INVERT LEVEL	M	MAINS GAS STAT RECORD
LP	LAMP OUTLET	M	MAINS WATER
MH	MANHOLE	M	MAINS WATER STAT RECORD
MW	MINIWELL	S	SEWER CW
OF	OUTFALL PIPE	S	SEWER CW STAT RECORD
OP	OUTFALL PIPE	S	SEWER FW
PC	PC	S	SEWER FW STAT RECORD
PP	PETROL PUMP	S	SEWER SW
RE	RODDING EYE	S	SEWER SW STAT RECORD
SHP	SHOWER HEAD PIPE	S	UNDENTIFIED CABLE
SOF	SOFFIT LEVEL	S	THAT FOR PROBLEMS
SV	STOP VALVE	U	UNIDENTIFIED TRACE
TB	TELEPHONE CALL BOX	U	UNIDENTIFIED TRACE
TL	TRAFFIC LIGHT	U	UNIDENTIFIED PIPE
TLB	TRAFFIC LIGHT BOX	V	VIDEO CABLE
TP	TRIAL HOLE/PIT	V	VIDEO CABLE STAT RECORD
WM	WATER METER	W	SURVEY BOUNDARY
WT	WATER TANK	W	WATER OUTSIDE SURVEY
WST	WATER STOP TAP		
WSV	WATER STOP VALVE		
EOT	END OF TRACE		
EPA	ENTRY POINT AREA		
UTL	UNABLE TO LIFT		
UTS	UNABLE TO SCALE		
VOT	VISIBLE END OF TRACE		
TLT	SIGNAL LOSS		
BLK	BLOCKAGE		
SOC	SOCKET/OTHER GPR CONTACTS		
RSL	RACKSHOP WIRE		
TOP	TOP OF KERB		
TOP	TOP OF PIPE		
TOW	TOP OF WALL		
	FITTING FROM RECORDS		

QUALITY LEVEL

A = Verification

B1 = Horizontal/Vertical location using multiple techniques

B2 = Horizontal/Vertical location using a single technique

B3 = Horizontal location using a single technique

B4 = Assumed route

C = Site Reconnaissance

D = Desktop utility records search

NOTES:

All levels relate to O.S (Newlyn) Datum, Established using network RTK. Survey plotted on a plane local grid, orientated to National Grid.

This Underground Utilities survey was conducted in compliance with the BSI PAS128:2014 standards.
Services linetypes display text indicating first an abbreviation of the services' purpose, e.g. ELECTRIC CONDUIT, followed by the Quality Level to which that service was located (eg. B4 = Assumed route).

Quality Level descriptions shown in the above legend are for reference purposes only and are not intended as detailed descriptions.
For more detailed descriptions, please consult the
BSI PAS 128:2014 standards document.

Lines annotated as GPR indicate a series of consistent subsurface anomalies located using the Ground Penetrating Radar and should be considered as Quality Level C. The nature of these anomalies could not be determine by non-invasive means. GPR lines that were identifiable as a service are shown as their respective service.

DISCLAIMER:

At SEP we use skilled and experienced staff, modern up to date techniques and top of the range electromagnetic and radar technology to locate and trace sub-surface utilities. However the performance of the equipment employed in non-invasive surveys can be adversely affected by factors outside the control of SEP. Therefore SEP cannot guarantee that all utilities present on site have been located. It is the responsibility of the Client to consult regional authority records and undertake trial digs where appropriate.

Where similar services run in close proximity it may be impossible to separately trace individual services as the trace signal can experience interference. In such cases, services will be shown as a single, generalized line. The displayed depth will refer to the shallowest detected utility.

Successful tracing of non-conductive materials may be limited. Drainage gulleys are dye tested where possible to prove connectivity but if is not always possible to introduce the sonde due to narrow pipe sizes and/or accumulated silt.

Depth information of underground services/features are generally accurate to within +/- 10% (i.e. a pipe at 2m deep may be accurate to +/-200mm) but this cannot be guaranteed. Depths shown usually refer to the top of the service. Gravity sewer and drain depths are usually to invert (base of drainage channel) unless otherwise stated.

Some above ground features may have been obscured at time of survey. It is not always possible to operate the Ground Penetrating Radar in areas including, but not limited to, dense vegetation, rubble, debris and/or rough/uneven ground.

Existing record information that was made available to SEP by the Client or by the statutory utility provider should be regarded only as an indication and cannot be guaranteed.

Excavation in the vicinity of services shown should be carried out with due diligence (Ref. HSG47).



SHEET LAYOUT

0 2m 4m 8m 12m 16m
SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

Client
Fletcher-Rae (UK) Limited.
Hill Quays
5 Jordan Street
Manchester
M15 4PY

Project Title
Utility Survey of Land at:
Elizabeth Street
Cheetham Hill
M8 8JJ

Surveyed	Drawn	Checked
L.Biggar	B.Carr	L.Biggar

Scale	Date	Drawing Ref.	No.	Size	Rev
1:200	Oct 21	S22909-U	01	A0	--

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N

PLAN GRID NORTH

File Name: S22909-U.dwg

LEGEND

AV	AIR VALVE	BT	BT
BT	BT INSPECTION COVER	BT	BT STAT RECORD
CB	CONTROL BOX	CABLE DUCT	CABLE DUCT
CBP	CONTROL BOLLARD POST	CCTV	CCTV STAT RECORD
COM	COMMUNICATIONS COVER	CATV	CABLE TV
CTV	CABLE TV COVER	CATV	CABLE TV STAT RECORD
DP	DOWN PIPE/DRAINAGE PANEL	DRAIN	DRAIN
DP	DOWN PIPE	DRAIN	DRAIN STAT RECORD
EB	ELEC BOX	ELEC	ELEC
EIC	ELEC INSPECTION COVER	ELEC	TELECOMS STAT RECORD
EM	ELEC METER	ELEC	EARTH ROD STAT RECORD
EP	ELECTRICITY POLE	ELEC	EARTH ROD STAT RECORD
FL	FLOOR LEVEL/OTHER LEVEL	ELEC	ELECTRIC
FH	FIRE HYDRANT	ELEC	ELEC STAT RECORD
G	GULLY	GRID	GRID CAPTION
GAT	GAS ISOLATION VALVE	GRID	GRID STAT RECORD
GST	GAS TAP	FUEL	FUEL LINE
GV	GAS VALVE	FUEL	FUEL LINE STAT RECORD
HC	HOUSE CONNECTION COVER	MAIN	MAIN LINE
IL	INVERT LEVEL	MAIN	MAIN LINE STAT RECORD
LP	LAMP OUTLET	WATER	WATER
MH	MANHOLE	WATER	WATER STAT RECORD
MW	MARKER POST	SEWER	SEWER
OF	OUTFALL PIPE	SEWER	SEWER STAT RECORD
PC	PC VALVE	SEWER	SEWER FM
PP	PETROL PUMP	SEWER	SEWER FM STAT RECORD
RE	RODDING EYE	SEWER	SEWER SW
SHP	SHOWER HEAD PIPE	SEWER	SEWER SW STAT RECORD
SOF	SOFFIT LEVEL	TRAFFIC	TRAFFIC CABLE
SV	STOP VALVE	TRAFFIC	TRAFFIC CABLE STAT RECORD
TAB	TELEPHONE JUNCTION/ CALL BOX	UNID	UNIDENTIFIED TRACE
TL	TRAFFIC LIGHT	UNID	UNIDENTIFIED PIPE
TLB	TRAFFIC LIGHT BOX	UNID	UNIDENTIFIED CABLE
TP	TELEPHONE POLE	VDC	VDC STAT RECORD
WM	WATER METER	SURVEY	SURVEY BOUNDARY
WO	WATER OUTLET	SURVEY	SURVEYED BOUNDARY
WOT	WATER STOP TAP		
WSV	WATER STOP VALVE		

EOT	END OF TRACE
NAD	NO ACCESS TO AREA
UTE	UNABLE TO LIFT
UTS	UNABLE TO SOAKE
SL	SIGNAL LOSS/ INTERFACE
TLT	SIGNAL LOSS
BLK	BLOCKED
OC	OTHER/OTHER GPR CONTACTS
MC	MICROPIPE WIRE
TOP	TOP OF PIPE
TOW	TOP OF WALL
FR	FITTING FROM RECORDS

QUALITY LEVEL

A = Verification

B1 = Horizontal/Vertical location using multiple techniques

B2 = Horizontal/Vertical location using a single technique

B3 = Horizontal location using a single technique

B4 = Assumed route

C = Site Reconnaissance

D = Desktop utility records search

NOTES:

All levels relate to O.S (Newlyn) Datum, Established using network RTK. Survey plotted on a plane local grid, orientated to National Grid.

This Underground Utilities survey was conducted in compliance with the BSI PAS128:2014 standards.
Services linetypes display text indicating first an abbreviation of the services' type, e.g. ELEC, followed by a hyphen and the Quality Level to which that service was located (eg. B4 = Assumed route).

Quality Level descriptions shown in the above legend are for reference purposes only and are not intended as detailed descriptions.
For more detailed descriptions, please consult the
BSI PAS 128:2014 standards document.

Lines annotated as GPR indicate a series of consistent subsurface anomalies located using the Ground Penetrating Radar and should be considered as Quality Level C. The nature of these anomalies could not be determine by non-invasive means. GPR lines that were identifiable as a service are shown as their respective service.

DISCLAIMER:

At SEP we use skilled and experienced staff, modern up to date techniques and top of the range electromagnetic and radar technology to locate and trace sub-surface utilities. However the performance of the equipment employed in non-invasive surveys can be adversely affected by factors outside the control of SEP. Therefore SEP cannot guarantee that all utilities present on site have been located. It is the responsibility of the Client to consult regional authority records and undertake trial digs where appropriate.

Where similar services run in close proximity it may be impossible to separately trace individual services as the trace signal can experience interference. In such cases, services will be shown as a single, annotated line. The displayed depth will refer to the shallowest detected utility.

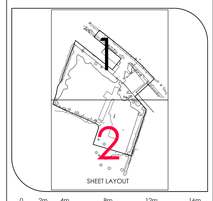
Successful tracing of non-conductive materials may be limited. Drainage gullies are also tested where possible to prove connectivity but if is not always possible to introduce the sonde due to narrow pipe sizes and/or accumulated silt.

Depth information of underground services/features are generally accurate to within +/- 10% (i.e. a pipe at 2m deep may be accurate to +/-200mm) but this cannot be guaranteed. Depths shown usually refer to the top of the service. Gravity sewer and drain depths are usually to invert (base of drainage channel) unless otherwise stated.

Some above ground features may have been obscured at time of survey. It is not always possible to operate the Ground Penetrating Radar in areas including, but not limited to, dense vegetation, rubble, debris and/or rough/uneven ground.

Existing record information that was made available to SEP by the Client or by the statutory utility provider should be regarded only as an indication and cannot be guaranteed.

Excavation in the vicinity of services shown should be carried out with due diligence (Ref. HSG47).



SHEET LAYOUT

0 2m 4m 8m 12m 16m

SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

Client
Fletcher-Rae (UK) Limited.
Hill Quays
5 Jordan Street
Manchester
M15 4PY

Project Title
Utility Survey of Land at:
Elizabeth Street
Cheetham Hill
M8 8JJ

Surveyed	Drawn	Checked
L.Biggar	B.Carr	L.Biggar

Scale	Date	Drawing Ref.	No.	Size	Rev
1:200	Oct 21	S22909-U	02	A0	--

Appendix D

CCTV Drainage Survey (Layout)

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N

PLAN GRID NORTH

File Name: S22909-T.dwg

LEGEND

AV	AIR VALVE	LBY	LAYBY
BB	BELISHA BEACON	MH	MANHOLE
BH	BOLLARD	MP	MARKER POST
BH	BORE HOLE	MS	MILE STONE
BM	BM	MP	MOORING POINT
BP	BENCH MARK	OH	OVER HEAD CABLES
BS	BUS STOP	OP	OUTFALL PIPE
BT	BT INSPECTION COVER	PB	POST OFFICE BOX
CCTV	CCTV CAMERA	PP	PYLON
CCTV	CCTV CAMERA POST	PP	PETROL PUMP
CH	CHAMBER	RE	RE
COM	COMMUNICATIONS COVER	RE	RODDING EYE
CP	CABLE POST/ JUNCTION	RL	ROOF LEVEL
CTC	CABLE TV CONTROL	RS	ROAD SIGN
DC	DRAINAGE CHANNEL	RTW	RETAINING WALL
DP	DRAINAGE PIPE	SP	SOIL VENT PIPE
DR	DRAIN	SAP	SAPLING
EIC	ELEC. INSPECTION COVER	SNP	NAME PLATE
EL	ELECTRIC	SP	SIGN POST
EJB	ELECTRIC BOX	SW	SOFFIT LEVEL
ER	EARTH ROD	TV	STOP VALVE
FB	FLOWER BED/ POLE	TB	TELEPHONE BOLLARD
FL	FINISHED FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FP	FLAG POLE/ MARKER	TL	TRAFFIC LIGHT
FV	FUEL VENT	TL	TRAFFIC LIGHT
G	GULLY	TM	TELEPHONE JUNC BOX
G.L	GROUND LEVEL	TP	TRAFFIC MASTER
GP	GATE POST	TP	TELEGRAPH POLE
GP	GUARD POST	TW	TRIAL WELL
GV	GAS VALVE	WM	WATER METER
IC	INSPECTION COVER	WO	WASH OUT
IL	INVERT LEVEL	WT	WATER TANK TAP
KO	KERB OUTLET	WV	WATER STOP VALVE
LAD	LADDER	03.94	TREE GIRTH (Dia.)
LP	LAMP DOWN	WS	TREE MULTI-GIRTH
LP	LAMP POST		

PAL	PALISADE		DRIP LINE
R/W	RAIL/ WATCH		EDGE COURSE
R/W	RAIL/ WIRE		KERB
C/W	CONC WALL		SLOPE
P/W	CONC PANEL		SURFACE CHANGE
S/W	STONE WALL/ BANK		TOP
P/W	POST AND RAIL		TOP BANK
L/S	IRON RAIL		BOTTOM BANK
C/L	CHAIN LINK/ BARBED		BUILDING
CL/L	CHAIN LINK		BUILDING CANOPY
(34.28)	TOP OF FEATURE		OVER HEAD ELECTRICAL
(34.28)	TOP		OVER HEAD TELECOM
	STATION		
	BOREHOLE		HEDGE
	BATTER		

NOTES:
All levels relate to O.S (Newlyn) Datum, Established using network RTK.
Survey plotted on a plane local grid, orientated to National Grid.

SURVEY STATIONS

Name	Easting	Northing	Height
SEP1	384134.697	400210.632	56.328
SEP2	384231.597	400241.539	56.552
SEP3	384190.157	400272.469	56.321
SEP4	384164.533	400301.546	56.401
SEP5	384208.632	400341.046	56.401
SEP6	384178.141	400414.075	55.959
SEP7	384137.777	400374.091	56.122
SEP8	384121.031	400343.634	56.122
SEP9	384243.322	400354.704	55.950
SEP10	384322.212	400313.363	55.578
SEP11	384218.814	400268.812	55.754
SEP12	384212.512	400242.174	54.825
SEP13	384104.586	400182.794	54.825
SEP14	384103.898	400167.336	54.281

0 2m 4m 8m 12m 16m
SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

Client
Fletcher-Rae (UK) Limited.
Hill Quays
5 Jordan Street
Manchester
M15 4PY

Project Title
Topographical Survey of Land at:
Elizabeth Street
Cheetham Hill
M8 8JJ

Surveyed	Drawn	Checked
I.Bryning	B.Carr	R.Critchley

Scale	Date	Drawing Ref.	No.	Size	Rev
1:200	Oct 21	S22909-T	01	A0	–

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N

PLAN GRID NORTH

File Name: 522909-T.dwg

LEGEND

AV	AIR VALVE
BB	BELISHA BEACON
BH	BORE HOLE
BH	BORE HOLE
BM	BM
BS	BENCH MARK
BS	BUS STOP
BT	BT INSPECTION COVER
CB	CATCH PIT/GULLY
CCTV	CCTV CAMERA POST
CH	CHAMBER
COM	COMMUNICATIONS COVER
CP	CONTROL POINT STATION
CTC	CABLE TV COVER
DC	DRAINAGE CHANNEL
DP	DRAINAGE POINT
DR	DRAIN
EIC	ELEC. INSPECTION COVER
EM	ELEC. METER
ELB	ELECTRIC BOX
ER	EARTH ROD
FL	FINISHED FLOOR LEVEL
FP	FINISHED PARAPET
FW	FLAG POLE
G	GULLY
GL	GROUND LIGHT
GP	GATE POST
GV	GAS VALVE
GW	GAS VALVE
IC	INSPECTION COVER
KIO	KERB INLET
KO	KERB OUTLET
LAD	LADDER
LD	LAMP DOWN
LP	LAMP POST
PAL	PALISADE
R/W	RAIL WATCH
C/W	CONC. WALL
C/W	CONC PANEL
P/W	POST AND WIRE
P/R	POST AND RAIL
T/B	IRON RAIL
T/B	TIMBER BOARDED
CALL	CHAIN LINK
(34.28)	TOP OF FEATURE
SEP14	SEP14
⊕	STATION
⊕	BOREHOLE
LBY	LIFEBUOY
MH	MANHOLE
MH	MANHOLE
MS	MILE STONE
MP	MOORING POINT
OP	OUTFALL PIPE
OP	OUTFALL POST
PB	POST OFFICE BOX
PP	PIPE
PP	PETROL PUMP
RE	RODDING EYE
RE	RODDING EYE
SL	SIGN LEVEL
RTW	RETAINING WALL
SVP	SOIL VENT PIPE
SP	SPIGOT
SNP	NAME PLATE
SOF	SOFFIT LEVEL
SOF	SOFFIT LEVEL
SV	STOP VALVE
TB	TELEPHONE BOLLARD
TJB	TELEPHONE CALL BOX
TL	TRAFFIC LIGHT
TL	TRAFFIC LIGHT
TMB	TRAFFIC MAST ARM
TP	TELEGRAPH POLE
TP	TELEGRAPH POLE
WM	WATER METER
WO	WASH OUT
WSV	WATER MAIN TAP
WSV	WATER STOP VALVE
(0).M	TREE GIRTH (Dia.)
WG	TREE MULTI-GIRTH
	DRIP LINE
	FENCE/GARDGE
	KERB
	RAIL
	SURFACE CHANGE
	TOP
	TOP BANK
	BOTTOM BANK
	BUILDING
	BUILDING CANOPY
	OVER HEAD ELECTRICAL
	OVER HEAD TELECOM
	HEDGE
	BATTER

NOTES:
All levels relate to O.S (Newlyn) Datum, Established using network RTK.
Survey plotted on a plane local grid, orientated to National Grid.

SURVEY STATIONS

Name	Easting	Northing	Height
SEP1	384154.959	400210.832	56.328
SEP2	384221.597	400241.528	56.762
SEP3	384180.157	400272.489	56.321
SEP4	384139.533	400303.449	56.167
SEP5	384206.632	400341.046	56.421
SEP6	384178.141	400414.075	55.959
SEP7	384151.691	400433.091	55.722
SEP8	384127.237	400453.634	55.722
SEP9	384243.322	400154.704	55.950
SEP10	384232.212	400121.363	55.779
SEP11	384218.814	400088.812	55.754
SEP12	384212.512	400062.513	55.615
SEP13	384154.584	400182.784	54.825
SEP14	384103.868	400167.338	54.281

0 2m 4m 8m 12m 16m
SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

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Surveyed	Drawn	Checked
I.Bryning	B.Carr	R.Critchley

Scale	Date	Drawing Ref.	No.	Size	Rev
1:200	Oct 21	522909-T	01	A0	--

Appendix E

Environment Agency Flood map for Planning Report

Flood map for planning

Your reference	Location (easting/northing)	Created
Elizabeth St	**384182/400152**	**31 Jan 2022 22:28**

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2021 OS 100024198. https://flood-map-for-planning.service.gov.uk/os-terms



Environment Agency

Flood map for planning

Your reference
Elizabeth St

Location (easting/northing)
384182/400152

Scale
1:2500

Created
31 Jan 2022 22:28

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 20 40 60m

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Appendix F

Manchester LLFA Correspondence

United Utilities Correspondence

Chloé Grimsley

From: Chloé Grimsley
Sent: 18 January 2022 10:16
To: floodriskmanagement@manchester.gov.uk
Cc: Niall Farnworth
Subject: RE: Elizabeth Street, Cheetham Hill, Manchester
Attachments: 078695-CUR-00-XX-ME-GE-0001_Elizabeth Street Logs.pdf; B078695 _EC_A_HistSlice10000.pdf; B078695_EC_A_Town500Seg.pdf; B078695_EC_A13 _HistSeg2500.pdf; 078695-CUR-00-XX-DR-GE-001-V01 - Cheetham Hill EHLP.pdf

Good Morning Laura, I hope you are well.

Further to your email below, and in response to your point – "Please be advised in general that if insufficient site investigation evidence is presented to prove or disprove the presence of any indicative culvert, and/or the masterplan does not appropriately take account of the route of any culvert, the LLFA may object to that Planning application."

Our GeoEnvironmental team have reviewed the historic data available with the on-site investigations that they have completed to date and have summarised as follows:

Earliest historical OS mapping for the site dated 1848 does not show evidence of a water course on site with the site occupied by fields. A possible water feature is noted to the south-east orientated approximately southwest to northeast, which splits circa 50m south east with branches orientated approximately north west to south east and north east to south west, the latter is shown adjacent to the southern site boundary. By the next available historic mapping (dated 1892-1893) there is no evidence of this potential off site water course and no evidence of a water course shown on site. Instead, the site and area to the south are occupied by a series of extensive 'clay pits' associated with a brick works circa 100m southeast. Clay pits remain present across the site until early 1960s when a depot is shown in the northwest and some smaller buildings. A car breakers yard is shown on site in the 1970s with a travelling crane on the east. Various works and warehouses and then present to the south of site and no evidence of the potential historic water course is shown.

The first phase of site investigation works was undertaken in May 2020 and comprised four cable percussive boreholes to up to 11.50m depth bgl and 10 machine excavated trial pits to up to 3.50m bgl. Made ground was found to be extensive across the site with the base not determined in all locations but BH05, where the base was determined at 6.00m bgl. A second phase of ground investigation has been undertaken in December 2021 with preliminary results indicating made ground depth varying from 6 to 18m bgl. The extensive made ground is likely to be associated with the backfilling of historic clay pits across the site. Considering the depth of made ground on site it is considered unlikely that any historic water courses remain, they are likely to have been diverted during clay pit excavation. Furthermore no evidence of a culvert has been found in ground investigation work to date.

In conclusion, historic maps do not show evidence of a historic water course on site, the feature therefore either pre dates OS map records or the feature is off-site (potential feature shown to the south). Where the feature did exist on site its considered likely that it would have been diverted as part of deep clay pit excavations and later backfilling. Based on the above it is considered highly unlikely that the historic water courses identified remain on the site.

I have attached the historic mapping and BH information for your review.

Please can you review the above and advise if this is acceptable to confirm the watercourses are unlikely to be present or if you would require any further investigation.

Kind Regards,
Chloé

Chloé Grimsley Principal Engineer
Curtins
T. 0161 236 2394 | chloe.grimsley@curtins.com

From: Flood Risk Management <floodriskmanagement@manchester.gov.uk>
Sent: 12 November 2021 14:17
To: Chloé Grimsley <Chloe.Grimsley@curtins.com>
Subject: RE: Elizabeth Street, Cheetham Hill, Manchester

Good afternoon Chloé,

Thank you for your email.

Please find attached our SuDS Requirement for Developers guidance which we recommend is reviewed to scope your drainage strategy.

Please find attached letter detailing our Data Screening Service. Should you wish to instruct us in this service, please confirm by email response and payment details will be sent to you.

Your queries are addressed down-thread in blue.

We trust this is of assistance in developing your strategy however should you have any further queries please do not hesitate to contact us.

Kind Regards,
Laura

Laura Peacock MESci(Geol) MCIWEM
Flood Risk Engineer – LLFA

Highways Service,
Growth and Neighbourhoods Directorate
Manchester City Council
PO Box 532
Town Hall
Manchester
M60 2LA
Web: http://www.manchester.gov.uk
****
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This footnote also confirms that this email message has been swept for the presence of computer viruses.
****

From: Chloé Grimsley <Chloe.Grimsley@curtins.com>
Sent: 03 November 2021 15:12
To: Flood Risk Management <floodriskmanagement@manchester.gov.uk>
Subject: Elizabeth Street, Cheetham Hill, Manchester
Importance: High

Good Afternoon,

We are currently producing an FRA and drainage strategy for a vacant site located off Elizabeth Street, Cheetham Hill, Manchester M9 8BB (NGR – X-384184 , Y-400168) – Please see location plan below:



The scheme proposals are for up to 8 Units consisting of industrial and office use. The site will also have Car and HGV Access/Parking facilities.

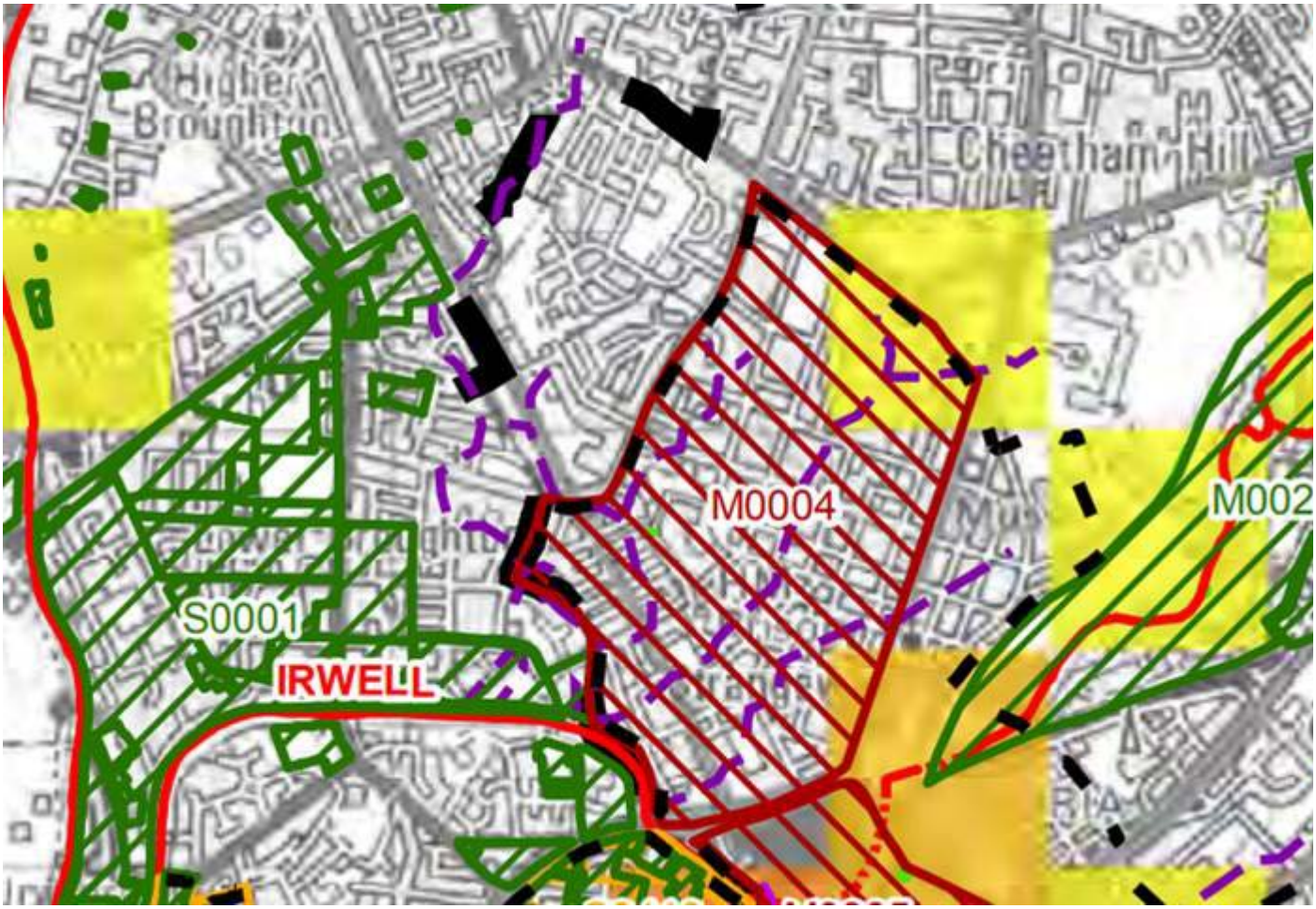
Flood Risk

The plot is approximately 1.9 hectares and located within Flood Zone 1, a Flood Risk Assessment will therefore be prepared to support the planning application.

Please could you advise of:

- any historic flood events associated with the site or in its vicinity? Please see attached letter detailing Data Screening service.
- Any information regarding historic watercourses within or in the vicinity of the site? Please see attached letter detailing Data Screening service.
  The SFRA mapping indicates potential lost watercourses within the site under the M0004 Parcel – see below maps. I note from looking on the planning portal there is a site to the south along the watercourse line – planning reference 107982/FO/2015/N1 but this hasn't identified the lost watercourse in its design – has any information been submitted in relation to the watercourse to confirm its presence? I have checked our files for 107982/FO/2015/N1; unfortunately we have nothing further on record. You may wish to consider enquiring with planning@manchester.gov.uk as to whether they hold any further submission/correspondence on indicative culverts for this legacy application.
  One of the connections appears to direct from the Manchester Fort Shopping Park – **was anything located during these works?** The construction of the site pre-dates the LLFA and therefore we will not have incorporated any findings of this site into our asset register. The Planning Portal shows 37 planning applications at this site for 'all time', of which 054623/OO/NORTH1/98 appears to have been the original site application. You may consider it of use to review the documents uploaded to the Planning Portal for this application and other associated applications. You may wish to consider enquiring with

planning@manchester.gov.uk as to whether they hold any further submission/correspondence on indicative culverts for any chosen legacy application of interest.





Surface Water Drainage

As the scheme is still in the early stage's infiltration testing has not been undertaken within the site, however the Geotechnical Engineer has advised that infiltration is unlikely and they are concerned regarding settlement due to any infiltration. On this basis we have noted that infiltration is considered unsuitable for this site. Evidence-based progression through the Drainage Hierarchy is required.

There are no watercourses in the immediate vicinity of the site, however we have noted regarding the mapping in the SFRA regarding 'lost watercourses' **please could you advise further on this and recommendations or requirements for investigation.** Please be advised in general that if insufficient site investigation evidence is presented to prove or disprove the presence of any indicative culvert, and/or the masterplan does not appropriately take account of the route of any culvert, the LLFA may object to that Planning application.

Should there be any presence of a watercourse, **please could you advise on the requirements for maintaining/diverting etc.** In the event that a culverted watercourse exists on a site, the riparian owner would be responsible for maintaining the culvert within their boundaries. Should a culvert be found onsite, we would expect feasibility assessment of connecting to the asset in line with the Drainage Hierarchy. Any proposed work to an ordinary watercourse (culverted or open) which could affect the flow would require an application for Land Drainage Consent, which should demonstrate that the proposed works are appropriate. This would include proposals to discharge surface water, proposed diversion etc. Forms can be found here and should be sent to the LLFA. Applications would be processed upon receipt of payment.

Where there is no presence of a watercourse, proposals to discharge surface water is to the combined sewer network on the basis there are no recorded surface water assets in the locality. The site appears to be covered by minimal hardstanding with the majority unused land and no known drainage connections. We assume greenfield restriction will be required – **please confirm.** From your description we would expect greenfield runoff rates to be used.

We understand you have been in discussions with the wider development team regarding opportunities for SuDS and we are currently investigation options to incorporate SuDS features within the Drainage Strategy.

Please could you advise on any requirements for the Drainage Strategy Submission. Please find attached MCC SuDS Requirement for Developers Guidance. Greenfield sites are expected to maximise retention of greenfield drainage characteristics, through maximised green SuDS where feasible.

I have attached the following information:

- Current Proposed Layout
- Existing Topo Survey
- Sewer Records

If you require any further information please let me know.

Kind Regards,
Chloé

Chloé Grimsley
Principal Engineer
T. 0161 236 2394
chloe.grimsley@curtins.com

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17-19 Whitworth Street West
Manchester M1 5WG

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Chloé Grimsley

From: Perry, Graham <Graham.Perry@uuplc.co.uk>
Sent: 15 November 2021 21:06
To: Chloé Grimsley
Cc: Wastewater Developer Services
Subject: Pre Development Enquiry for : Elizabeth Street, Cheetham Hill M8 8JJ UU reference Number : UU Ref. 4200044839

Pre Development Enquiry for: Elizabeth Street, Cheetham Hill M8 8JJ UU reference Number : UU Ref. 4200044839

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 3723223 or refer to the link below:

https://www.unitedutilities.com/builders-developers/working-near-our-assets/

I response to your specific queries:

- There is an existing 225mm combined sewer shown on the sewer records. A GPR survey has been undertaken, however there were no accessible locations within the clients owned land or nearby public owned land.
  Please could you advise how access can be made to locate the sewer to determine its position and depth?
  We are currently planned to undertake some drainage surveys in the coming weeks. – You could either negotiate access into third party land or carry out slip trenches across the sewer as it crosses your site to confirm alignment and depth

- The existing 225mm combined sewer crosses below the proposed site access, although the existing site appears to be an existing access it appears relatively informal. If the existing sewer is less than 1.2m cover to the pipe under the proposed access please advise if we need to concrete encase?
  If the sewer has more than 1.2m cover, please advise if we need to do anything further. - The available level information I have suggests that the sewer is lower than the minimum 1.2m. However the line may clash with any sewers crossing the site to enable a connection into Elizabeth Street. To avoid this you may want to consider incorporating the upstream sewer in your proposals and form a connection which will create a break to allow you to cross

- Please advise of sewer easement for the 225mm combine public sewer. - Minimum easement width is 6m

- Please advise If new connections to the public sewer in Elizabeth Street is possible for both foul and surface water. The existing site may have some minor areas drained but the majority is generally unused and essentially greenfield.
  Greenfield Rates are:
  QBar – 11.1 l/s, 1 Year – 9.6 l/s, 30 Year -18.8 l/s, 100 Year – 23.1 l/s. refer to response below

- Please advise whether manholes can be proposed within the site with direct connection to the sewer (via saddle) in Elizabeth Street or if preference is for a new manhole on the sewer in Elizabeth Street. – An offset

manhole is possible when you cannot physically build a new manhole over the sewer due to the presence of other utilities but we look at schemes on a case by case basis

- Please advise of any historic flooding records for the site/locality. Modelling data suggests high surcharge levels in the 225mm combined sewer crossing your site

Foul Water

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

Our preferred point of discharge would be to the 400mm x450 mm diameter public combined sewer within Elizabeth Street located to the north of your proposed development at an unrestricted rate.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.
This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

For guidance, The **North West SuDS Pro-Forma** provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:

https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

https://www.gov.uk/government/publications/groundwater-protection-position-statements

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Highway Drainage

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

Public Sewer

In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.

Once evidence is provided as outlined above, United Utilities will consider a connection to the 400mm x 450mm diameter public combined sewer within Elizabeth Street located north of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 11l/s. Variable flow rates will not be permitted

As a Water Company, we have no obligation to accept highway drainage into our public sewer network. However, should your proposals include runoff from highways, we would request that consideration is given to SuDS components that deliver source control are incorporated within the design of the scheme to reduce the volume and frequency of discharges of these flows to the public sewer.

Levels

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Land drainage / Overland flows / track drainage

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the pubic sewerage network under any circumstances

Existing Wastewater Assets Crossing the Site

According to our public sewer records there are public sewers located within your site boundary. We will require unrestricted access to the sewer for maintenance purposes, we would ask that you maintain a minimum clearance of 6m which is measured 3m from the centre line of the pipe unless there happens to be a formal easement agreement in place, in which case the specified easement width would apply. If you cannot achieve this then you may wish to consider diverting and or abandoning the public sewer.

Please refer to the link below to obtain full details of the processes involved with sewer diversions:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-diversions/

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address: **DeveloperServicesWater@uuplc.co.uk**. Further information for this service can be found on our website via the link below:

https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/

Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-connections/

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

If we can be of any further assistance please don't hesitate to contact us further.

Kind regards,

Graham Perry

Graham Perry
Development Engineer
Developer Services
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T: 01925 679405
unitedutilities.com

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Appendix G

Proposed Drainage Layout – Surface Water

Proposed Surface Water Catchments

Proposed Drainage Layout – Foul Water

"RESIDUAL HAZARD REGISTER (RELATES TO CIVIL/STRUCTURAL MATTERS ONLY)
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HAZARD REGISTER

Hazard Ref.	Item (Feature, Element or Activity)	Potential Hazard Identified	Action (Information to Assist Control)
3.00 Existing Buried & Overhead Services			
3.01 ⚠	Public combined sewer known to cross site. Location and depth not been confirmed.	Existing sewer could be damaged during construction activity.	Carry out additional site investigations to locate the public combined sewer.

KEY

- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED FOUL WATER DRAINAGE
- PROPOSED COMBINED WATER DRAINAGE
- EXISTING PUBLIC SEWER (APPROXIMATE LOCATION)
- PROPOSED RAINGARDEN (TO LANDSCAPE ARCHITECTS DETAILS)
- PROPOSED OIL SEPARATOR
- PROPOSED ATTENUATION TANK

OTHER DISCIPLINE DRAWING REFERENCES

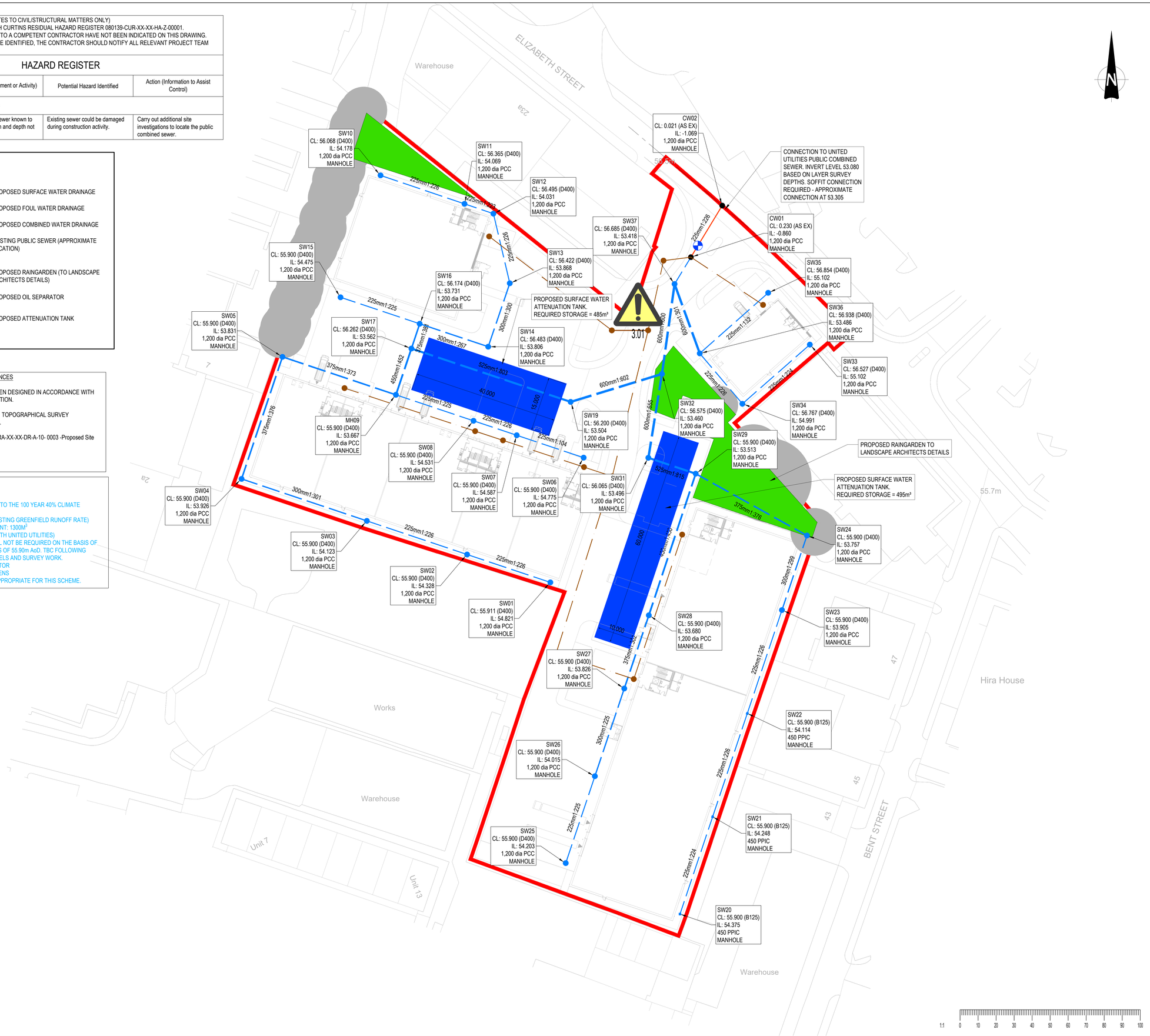
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ARCHITECTS DRAWING REF: '21039-FRA-XX-XX-DR-A-10- 0003 -Proposed Site Plan_Rev --'. Dated 24.01.22

DESIGN PHILOSOPHY

SURFACE WATER DESIGN
THE DESIGN PROVIDES CAPACITY UP TO THE 100 YEAR 40% CLIMATE CHANGE EVENT.
SW FLOW RATE: 11L/S (BASED ON EXISTING GREENFIELD RUNOFF RATE)
APPROXIMATE STORAGE REQUIREMENT: 1300m³
OUTFALL: 225mmØ (TO BE AGREED WITH UNITED UTILITIES)
LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED ON THE BASIS OF ACHIEVING MINIMUM GROUND LEVELS OF 55.90m AoD. TBC FOLLOWING FURTHER DESIGN OF PROPOSED LEVELS AND SURVEY WORK.
POLLUTION TREATMENT: OIL SEPARATOR
SUSTAINABLE DRAINAGE: RAIN GARDENS
INFILTRATION IS NOT CONSIDERED APPROPRIATE FOR THIS SCHEME.



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12. OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.

Rev:	Description:	Date:	By:	Chkd:
P02	ISSUED FOR PLANNING	31/01/22	LK	CG
P01	FIRST ISSUE	21/01/22	LK	CG

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Status: SUITABLE FOR INFORMATION — S2

Project: ELIZABETH STREET, CHEETHAM HILL

Drg Title: PROPOSED DRAINAGE STRATEGY SURFACE WATER

Drawn By	Designed By	Checked By
LK	LK	CG
	Date: 20/01/22	Scales @ A1: 1:500

Project No - Originator - Function - Spatial - Form - Discipline - Number: 080139 - CUR - XX - XX - D - C - 92000

Revision: P02

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Hazard Ref.	Item (Feature, Element or Activity)	Potential Hazard Identified	Action (Information to Assist Control)
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3.01 ⚠	Public combined sewer known to cross site. Location and depth not been confirmed.	Existing sewer could be damaged during construction activity.	Carry out additional site investigations to locate the public combined sewer.

KEY

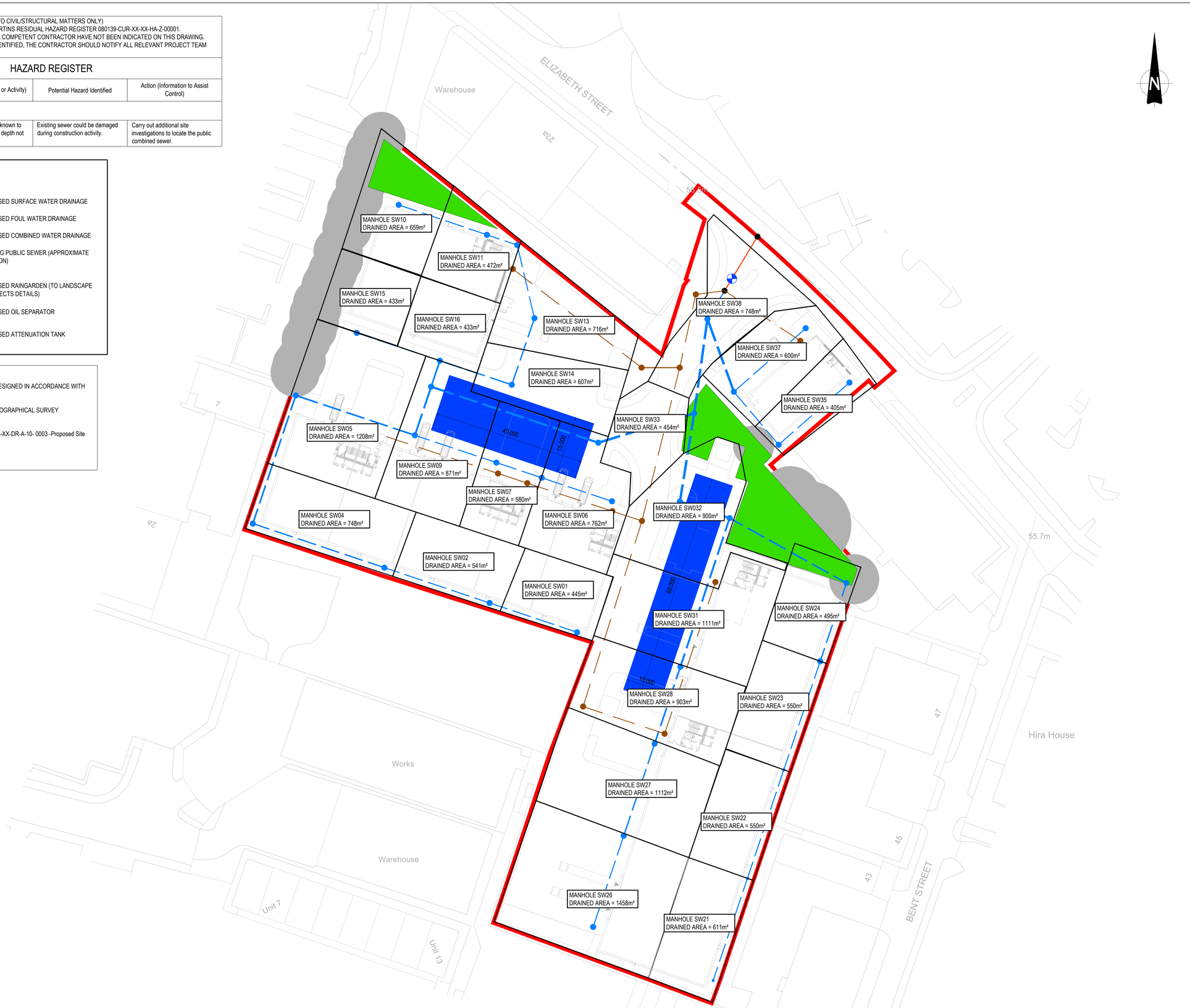
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- PROPOSED OIL SEPARATOR
- PROPOSED ATTENUATION TANK

OTHER DISCIPLINE DRAWING REFERENCES

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' TOPOGRAPHICAL SURVEY REF: TOPOGRAPHICAL SURVEY 'S22909-T_Rev --'. Dated September 2021.

ARCHITECTS DRAWING REF: '21039-FRA-XX-XX-DR-A-10- 0003 -Proposed Site Plan_Rev --'. Dated 24.01.22



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Rev:	Description:	Date:	By:	Chkd:
P01	ISSUED FOR PLANNING	31/01/22	LK	CG

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Status: SUITABLE FOR INFORMATION — S2

Project: ELIZABETH STREET, CHEETHAM HILL

Drg Title: PROPOSED DRAINAGE STRATEGY CATCHMENT AREAS

Drawn By	Designed By	Checked By
LK	LK	CG
	Date: 20/01/22	Scales @ A1: 1:500

Project No - Originator - Function - Spatial - Form - Discipline - Number	Revision
080139 - CUR - XX - XX - D - C - 92001	P01

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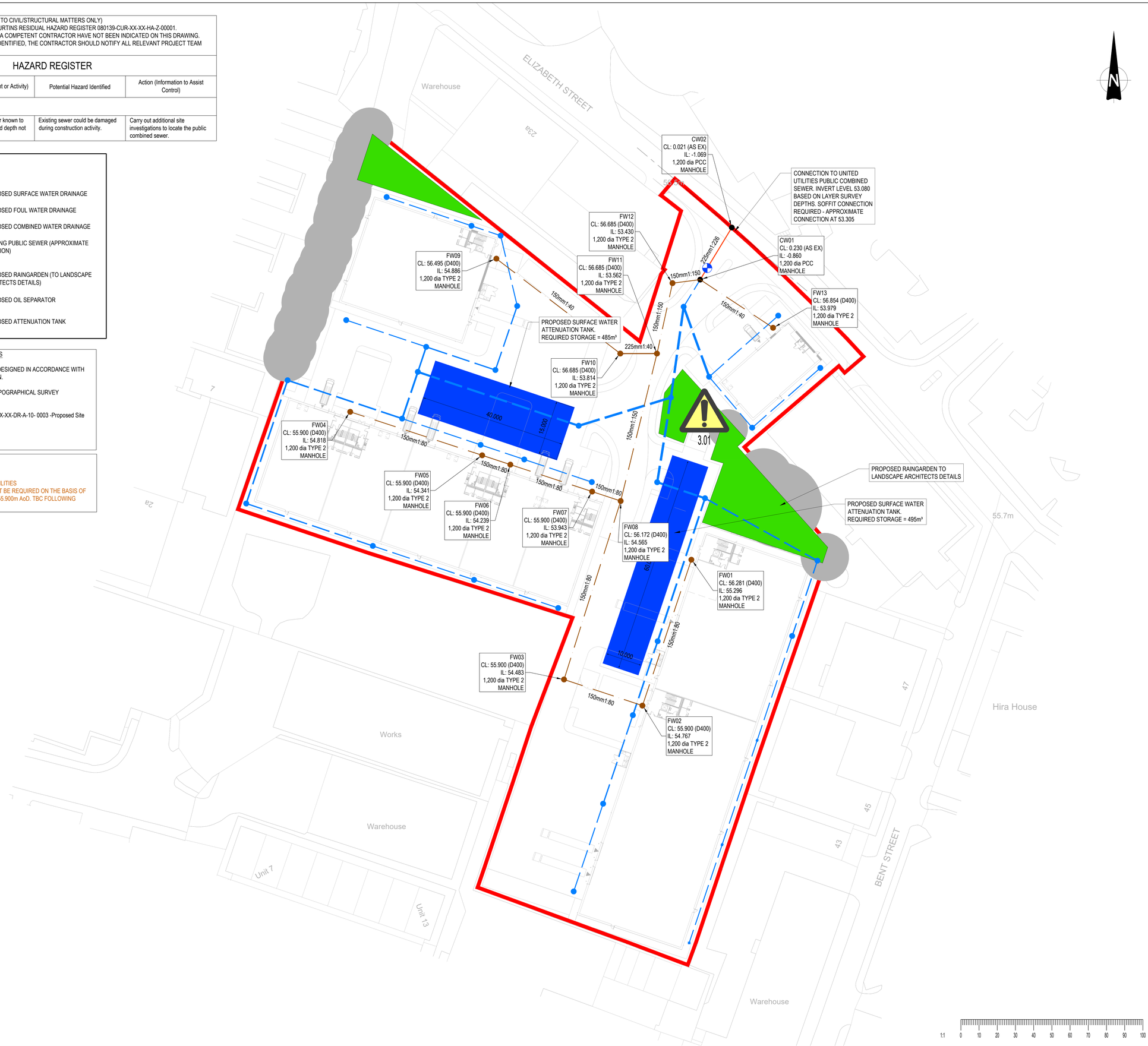
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ARCHITECTS DRAWING REF: '21039-FRA-XX-XX-DR-A-10- 0003 -Proposed Site Plan_Rev --'. Dated 24.01.22

DESIGN PHILOSOPHY

FOUL WATER DESIGN
FW PEAK FLOW RATE: TBC
OUTFALL: TO BE AGREED WITH UNITED UTILITIES
LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED ON THE BASIS OF MINIMUM GROUND LEVELS BEING SET AT 55.900m AoD. TBC FOLLOWING FURTHER DESIGN AND SURVEY WORK.



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8. ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK.
9. ALL RAINWATER AND FOUL POP UPS LOCATIONS AND SIZES HAVE NOT BEEN INDICATED ON THIS DRAWING AND ARE TO BE CONFIRMED BY THE ARCHITECT AND M&E ENGINEER.
10. COVER LEVELS, GULLY POSITIONS, AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/ LANDSCAPE ARCHITECT.
11. ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS. THESE ARE TO BE CONFIRMED ONCE A DETAILED CAPACITY CHECK HAS BEEN UNDERTAKEN AT A LATER DESIGN STAGE.
12. OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.

Rev:	Description:	Date:	By:	Chkd:
P01	ISSUED FOR PLANNING	31/01/22	LK	CG

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Status: SUITABLE FOR INFORMATION — S2

Project: ELIZABETH STREET, CHEETHAM HILL

Drg Title: PROPOSED DRAINAGE STRATEGY FOUL WATER

Drawn By	Designed By	Checked By
LK	LK	CG
	Date: 20/01/22	Scales @ A1: 1:500

Project No - Originator - Function - Spatial - Form - Discipline - Number: 080139 - CUR - XX - XX - D - C - 92002
Revision: P01

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