



British Legion Site, Wythenshawe

DRAINAGE STRATEGY REPORT



24th July 2023

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PREPARED BY John Marshall



Drainage Strategy Report

Prepared for :



British Legion Site, Wythenshawe

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Alan Johnston Partnership Ltd.

Company No. 13204766

British Legion Site, Wythenshawe Drainage Strategy Report

1.0 Introduction

This Drainage Strategy Report (DSR) has been prepared on behalf of Wythenshawe Community Housing Group (WCHG) for the development of the land off Woodhouse Road in Wythenshawe. The site is less than 1 hectare in size and situated in Flood Zone 1, and shall be occupied by a three storey building, to provide fourteen new dwellings For the local area. The site is currently a disused grassed area, following the demolition of the previously existing British Legion in excess of twelve months ago; the site is classed as Greenfield.

As the development is less than 1 hectare and lies within Flood Zone 1, in accordance with PPS25 a Flood Risk Assessment should not be required. The Manchester City Council (MCC) Strategic Flood Risk Assessment (SRFA) has identified the site as being situated in the Manchester & Trafford South Critical Drainage Area (CDA). Therefore, in accordance with the SRFA, a FRA is required for all developments over 0.5 hectares situated in a CDA; regardless of the Flood Zone it is situated within. As the site has been identified as 0.117 hectares in total area, it is not considered that a Flood Risk Assessment (FRA) is required and a Drainage Strategy Report shall be satisfactory.

The purpose of this report is to present a site-specific assessment of drainage strategy based on available information, to identify necessary measures particular to proposed development for the site, with respect to a particular probability of flooding. The flood levels identified are dependent on the correctness of the current conditions, as stated in this report and the prediction of future climatic conditions implicit in the National Planning Policy Framework.

For any size of storm event, the procedure will always yield a probability that the event will occur in any year, albeit the probability is smaller for larger events. The predicted storm event has a probability of occurrence in any year and the derived flood level has an associated probability of exceedance. This means that there is always a risk that property flooding could occur one or more times in any year.

More specifically, the development of any site must be carried out in such a way as to mitigate any potential flood risk, both on and off site from all sources of flooding and be

fully compliant with the requirements of the Manchester City Council (MCC), Lead Local Flood Authority (LLFA).

Therefore, this report should not be interpreted or relied upon as providing a guarantee against flooding. There is always a residual risk that flooding will occur, and it is not possible to predict a zero risk of flooding.

2.0 site description

The proposed development site is located in the Wythenshawe, to the west of Woodhouse Road, at National Grid Reference SJ 82819 87384 and postcode M22 9TE. To the north of the development area is Brownwood Hall Church, while to the south is the head offices of WCHG, while the western boundary is marked by existing parking provision; that is remain. The site is currently overgrown with grasses sitting on the boundaries, around the extent of the previous British Legion.

The location of the existing site is illustrated in Appendix A, showing the surrounding areas and the current site situation, the extent of the area to which the application relates is shown as a red line boundary.

The total site area available is 0.117ha with the topography of the site having the northern and eastern boundaries around the 57.500m AOD, the western boundary sitting at 57.60m AOD and the point of access set at 57.60m AOD.

An aerial photo is included in Appendix B to illustrate the site at the present day and the topographic survey is included in Appendix C.

2.1 Geology

The British Geological Survey 1:50,000 geology maps show that the development site is underlain superficial deposits comprising of Till Devensian Diamicton of Sandy gravelly cobbly deposits, underlying bedrock is reported to be of Bolin Mudstone Member, comprising of Mudstone.

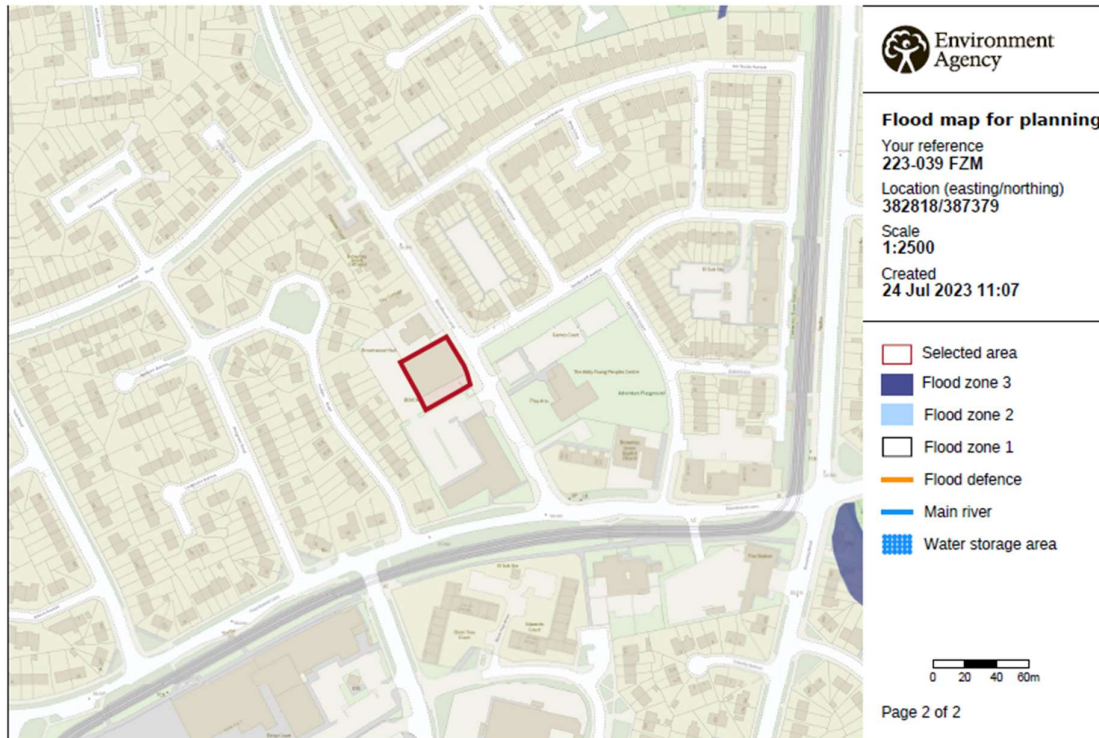
2.2 Hydrogeology

The DEFRA groundwater magic maps show that the Glacial Till superficial deposits are classified as a secondary undifferentiated aquifer, the groundwater maps also show that the underlying Bolin Mudstone is classified as a Secondary B aquifer.

There are no recorded groundwater / potable water abstraction licenses within 500m of the site and the site is not recorded to be within a Groundwater Source Protection Zone.

The development site is shown to be within an area of low-medium Groundwater vulnerability,

The nearest watercourse feature is Baguley Brook that lies 1.1km to the south west of the proposed development. The site is located in Flood Zone 1, as an area identified by the Environment Agency (EA) not at risk of flooding from rivers and streams.



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3.0 Proposed development

The proposed development consists of circa fourteen new dwellings consisting of 1 bedroom apartments, over three storeys of a single apartment building. These dwellings shall be accessed by a new proposed Parking area, that shall be accessed off Woodhouse Lane, with some dwellings fronting directly onto the highway. The apartment building shall be accompanied by private parking provision off the highway to the southern extent of the site.

The proposed development site covers a total area of approximately 0.117ha (App D), the development layout is shown within Appendix D indicating the Apartment building and associated parking provision.

To enable a viable scheme, the proposed site levels are constrained by the surrounding highway and existing buildings to the north and east. A proposed site plan is attached in Appendix D.

4.0 Development and Drainage Strategy

4.1 Effect of Proposed Development on Flood Risk

As previously outlined in Section 2.0, the existing site covers a total area of 0.117ha and is a Greenfield site, As the existing site has active no drainage systems positively connecting to the UU sewer system, the introduction of the new roof area, access road and parking area, the development will need to assessed to determine if it leads to an increase in impermeable area.

Existing Impermeable Area (Ha)	Proposed Impermeable Area (Ha)
0.000	0.087

As demonstrated in the above table, for the proposed development, the changes to the existing site will increase the volume of impermeable areas and as such, the proposed development in these areas will lead to an increase in the;

- Volume of surface water ponding on the site
- Volume of surface water runoff leaving the site or discharging into surrounding areas
- Peak discharge rate from the site.

Accordingly, site-wide drainage systems are required to drain the foul and surface water flows arising from the proposed development. Where possible, any existing drainage networks should be utilised. Appropriate design and construction of these systems as set out in Section 4.3 should ensure that there is no increase in offsite flood risk that would otherwise impact downstream areas.

4.2 Existing Drainage Systems

As can be seen from the United Utilities maps, attached in Appendix F, there is an existing 225mm/300mm C.W public sewer located within Woodhouse Lane, falling south to north. The MH 8301 to the eastern boundary of the site area has an interpolated invert of 54.550m

AOD . This sewer has been identified as a point of discharge for S.W & F.W flows from the proposed development.

4.3 Proposed Drainage Strategy

As outlined above in section 4.1, site-wide drainage systems are required to drain the foul and surface water flows arising from the proposed development. The proposed drainage systems must ensure that there is no increase in offsite for flood risk, for all storms up to the 1:100-year event with an allowance for climate change; that would otherwise impact downstream areas.

4.3.1 Surface Water Drainage

The Building Regulations - Approved Document H (2002) details a hierarchy of potential methods for disposing of surface water as shown below in order of preference:

- Discharge via infiltration
- Discharge to watercourse
- Discharge to sewer

Considering the hierarchy above, the surface water network for the proposed site should infiltrate to ground where viable.

As laid out within section 2.2 the site investigation information and the British Geological Survey (BGS) 1:50,000 superficial geology maps that the site is underlain Till Devensian Diamicton of granular strata above a bedrock and due to the site's history is expected to have significant depths of made ground.

While no infiltration testing or falling head tests are noted to date, the strata of the site area, identify the ground as having low permeability. Further investigation In accordance with the requirements of BRE 365 should be carried out to confirm this.

With the infiltration capacity within the ground initially dismissed, it is not considered a viable option for the discharge of surface water to utilise SuDS and infiltration systems.

As the possibility of infiltration is ruled out by at this point, the intention for the development would be to discharge to watercourse/ waterbody. The nearest waterbody is Baguley Brook.

Due to the location of the Watercourse, it is not considered viable to discharge S.W flows to this point, as it is separated from the development area, by third party land and is

inaccessible to any proposed sewerage network in service purely of the proposed development.

With discharge via infiltration and to a watercourse ruled out. The only practical solution for discharge of the surface water and Foul drainage is to discharge to the public sewerage system.

To this effect, correspondence with United Utilities has been sought for clarification of their preferred point of discharge and rate of S.W discharge from the development. It is expected that on the basis of the information identified within this report, that the combined manhole 8301in Woodhouse Lane is preferred point of discharge.

While every effort to utilise, any suitable existing systems should be made, the drainage systems should be designed to suit the proposed site layout and topography which aims to provide an efficient design.

In line with the Design & Construction Guidance (DCG) the requirements for the design of new surface water drainage systems are as follows:

Below ground piped drainage to be sized to accommodate the 1 in 2-year (50% AEP) design storm without surcharge.

System to be designed not to flood any part of the site in a 1 in 30-year (3% AEP) design storm.

For events in exceedance of the 1 in 30-year design storm and up to and including the 1 in 100-year event, site drainage and topography should be designed where practicable to route surface water run-off away from buildings to safe above-ground storage areas on site, thereby removing flood risk to properties and preventing this run-off from leaving the site and increasing flood risk elsewhere.

For each design case described above, the design storm is the critical storm duration for the site conditions. In the case of the 1 in 100-year design storm, a 45% increase in the peak rainfall intensity is applied to allow for the estimated worst-case impacts of climate change. This is in accordance with Table 5 of the Technical Guidance to the National Planning Policy Framework.

Suitable systems of below ground drainage will be required to contain as a minimum requirement, the 1 in 30-year event. Additionally, any surface water run-off from events that exceed the design capacity of the new drainage system, up to and including the 1 in 100-year

(+45%) event, will be contained within the drainage network or retained on-site in safe storage areas.

Should they be required, measures to prevent oil and other contaminants being passed forward to the existing surface water sewer should also be incorporated into the design of the surface water system, through the use of appropriate oil separators or other appropriate pre-treatment methods.

In line with common practice and MCC LLFA guidelines, it is proposed the surface water discharge from the proposed development should discharge at rates not in excess of a value equivalent to the Greenfield Qbar rate or the minimum practicable rate of discharge, whichever is the greater; for all respective storm periods. A calculation of the Greenfield Run off can be found in Appendix E.

Return Period (yr.)	Existing Discharge Rate (l/s)
1 in 2 (Qbar)	0.4
1 in 30	0.8
1 in 100	0.9

An assessment of the existing Greenfield surface water run-off from the existing site area has been carried out and demonstrates that the Qbar value for the site with is 0.40l/s,. Therefore, in accordance with reducing flood risk and compliance with MCC LLFA requirements, a restricted flow rate equivalent to Qbar is recommended for the proposed development area for all storms up to and including the 1 in 100-year return period, with an allowance for climate change.

This should be considered in conjunction with the maintenance requirements of the proposed hydrobrake in service of limiting surface water flows from the development, which will require a minimum orifice size of 100mm in diameter; producing a minimum practicable rate of discharge from the development of 5l/s . Therefore in accordance with the requirements of UU, the LLFA and practical restrictions, the development should be limited to a maximum pass forward flow rate of 5l/s for all return periods and storm events.

Based on the above discharge limit, there shall be a new S.W network to serve the proposed development that shall discharge the combined sewer to the east of the development.

Discharge into this sewer shall be agreed under with United Utilities Section 104 of the of the Water Industry Act 1991 and with MCC LLFA.

As shown in Appendix H outline drainage layout the proposed S.W Network shall discharge no more than 5l/s. This network shall consist of oversized pipes and manholes providing effective storage to accommodate all storm events, subject to control by a vortex flow control system prior to combining on site with the F.W flows and then discharging to existing manhole 8301 on the combined sewer within Woodhouse Lane.

Porous paving shall be installed as a source control measure to accommodate the first 5mm of rainfall, prior to discharging to the attenuation system.

The surface water drainage systems are to be designed to restrict the discharge to the required rate, up to and including a 1 in 100-year return period plus 45% climate change design storm, while ensuring that no flooding occurs within the 100-year return period and that any flood water for extreme events shall be appropriately accommodated away from proposed and existing dwellings. . This S.W network shall be designed in accordance with the below hydraulic criteria:

- Volumetric Run off Co-efficient - 0.84 (winter)
- Urban Creep factor - 0%
- Climate Change factor for 1:100 return event - 45%
- Maximum Storm duration up to - 1440 minutes
- M5-60 (mm)18.000 Ratio R 0.389(suitable for the locale)

Urban Creep has been dismissed as a requirement for this development, as the Apartment building will be owned and operated by WCHG, with the proposed hardstanding covering 74% of the development area. Any expansion of the apartment building would be subject to a new planning application and considerations of further impermeable area would be subject to review at that point.

The hydraulic calculations demonstrating the system dynamics for the proposed network is shown in Appendix G, as are the calculations for the proposed network's operated in the scenario where the receiving sewer is surcharged.

The surface water drainage strategy and discharge rate should be confirmed via more detailed discussions with United Utilities and the Lead Local Flood Authority prior to the commencement of any works.

4.3.2 SuDS Summary

As outlined within the summary table below, all SuDS techniques have been considered for this development;

SuDS Technique	Suitable for This Development?	Reasoning
Green Roof	✗	Impractical due to roof pitch and domestic ownership
Rainwater Harvesting	✗	Impractical due to lack of demand for greywater.
Basins, Ponds & Swales	✗	Unsuitable due to lack of available space to south of site.
Filter Strips	✗	Unsuitable due to topography of site and lack of available areas to south of site.
Bio-retention Areas	✗	Suitable but only incorporated for small hardstanding areas due to impermeable strata and topography of site.
Infiltration Techniques	✗	Unsuitable due to impermeable strata.
Permeable Surfaces	✓	Suitable and incorporated where possible, but only as non-infiltration due to impermeable strata.
Tanked/Piped Systems	✓	Suitable and incorporated.

Green roof areas have not been included due to roof pitch being untenable for the installation and maintaining of sufficient support system for plant life.

Rainwater harvesting was also considered but due to a lack of greywater demand and the cost associated with tanks and pumping of the separate system, it has been deemed as impractical to include a rainwater harvesting system.

Due to the lack of available space across the south of the site it is envisaged that a pond, detention basin or swale would not be suitable for the proposed site.

Filter drains/strips were also considered but due to a lack of available areas, filter drains/strips areas have not been included. Due to a lack of available areas and the topography of the site, bio-retention areas have only been incorporated to drain small impermeable areas.

As previously stated infiltration is not feasible across the site and therefore the use of infiltration SuDS techniques is not possible. Despite this, the use of non-infiltration permeable surfaces such as permeable paving/porous tarmac has been considered and incorporated within the private and shared drives.

Finally, the use of oversized pipe networks is suitable and is therefore also incorporated. As indicated within the Outline Drainage Strategy Drawing attached in Appendix H, The use of SuDS solutions across the site is subject to change and is dependent upon the finalised site layout, detailed drainage design and the results of additional surveys.

However, the drainage strategy and proposed SuDS solutions should adhere as close as possible to the above outline drainage strategy and SuDS solutions.

4.3.3 Water Quality Assessment

Managing the water quality of the surface water runoff from the proposed development is important to ensure that the receiving surface waters or groundwater are well protected. Generally, this can be achieved through the use of well-designed SuDS systems which provide treatment and pollution removal to the surface water runoff.

Standard S3 of the Statutory National Standards for Sustainable Drainage Systems (2018) details the water quality management and addresses the drainage design requirements to minimise the potential pollution risk.

As the proposed development consists of roof areas, car park areas and low traffic roads, in accordance within Table G3.2 of the Statutory National Standards for Sustainable Drainage Systems (2018) the pollution hazard level is low and as such the simple index approach can be used to assess the treatment requirements for the low risk of pollution.

The simple index approach is outlined within Chapter 26 of CIRIA Report C753 - The SuDS Manual. Therefore, using Table 26.2 and applying the proposed site description above, results in a low pollution hazard level, with the pollution hazard indices being; TSS - 0.5, Metals - 0.4 and Hydrocarbons - 0.4.

Assessing this against Table 26.3 of CIRIA Report C753 - The SuDS Manual using the SuDS treatment train of green roofs and permeable paving results in the mitigation indices outweighing the pollution hazard indices identified above. The use of a porous paving itself results in mitigation indices of; TSS - 0.7, Metals - 0.6 and Hydrocarbons - 0.7, which would be sufficient.

Therefore, as the mitigation indices are equal to or greater than each of the pollution hazard indices the use of permeable paving is deemed acceptable from a pollution mitigation perspective and as such complies with the water quality requirements of Standard S3 of the Statutory National Standards for Sustainable Drainage Systems (2018).

4.3.4 Foul Water Drainage

Foul water drainage disposal is set out in Part H of the Building Regulations in order of priority the preferred methods are;

- Public sewer
- Septic tank
- Cesspool.

The foul water system shall be designed in accordance with;

BS EN 752:2008 (Drain and sewer systems outside buildings)

The Design & Construction Guidance (DCG)

Technical Guidance to the National Planning Policy Framework document (Department for Communities and Local Government, March 2012).

BS EN 12056-2:2000 (Drainage systems inside buildings)

Building Regulations Approved Document H, Drainage and waste disposal. (Office of the Deputy Prime Minister, December 2010).

Foul water shall discharge to the existing C.W manhole 8301 in Woodhouse Lane, at an unrestricted rate.

The F.W shall combined with the S.W flows, prior to discharging into the local combined sewer and the proposals shall be agreed with UU under a Section 104 Agreement. The proposed foul water drainage design can be found in Appendix H.

The foul water drainage strategy and discharge rate should be confirmed via more detailed discussions with United Utilities and the Lead Local Flood Authority prior to the commencement of any works.

4.4 Compliance with LASOO Non-Statutory Technical Standards for SUDS

In compliance with the runoff destinations guidance within the LASOO Non-Statutory Technical Standards for Sustainable Drainage: Best Practice Guidance, infiltration is not feasible; therefore, the surface water runoff is designed to discharge to the public sewer.

S1. Where the drainage system discharges to a surface water body that can accommodate uncontrolled surface water discharges without any impact on flood risk from that surface

water body (e.g., the sea or a large estuary) the peak flow control Standards (S2 and S3) and volume control Standards (S4 to S5) need not apply.

The site does not discharge to a surface water body that can accommodate uncontrolled surface water discharges, as it has only previously received greenfield run off and the culvert has been sized appropriately; therefore, Standards S2 - S5 shall apply.

4.4.1 Peak Flow Control

S2. For greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1-year rainfall event and the 1 in 100-year rainfall event should never exceed the peak greenfield runoff rate for the same event.

The site is considered greenfield and the discharge rate for the 1 in 100-year return period has been restricted to a minimally practicable rate of 5l/s.

S3. For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100-year rainfall event should be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.

The site is Greenfield and this standard does not apply.

4.4.2 Volume Control

S4. Where reasonably practicable, for greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100-year, 6-hour rainfall event should never exceed the greenfield runoff volume for the same event.

S5. Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100-year, 6-hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event.

S6. Where it is not reasonably practicable to constrain the volume of runoff to any drain, sewer or surface water body in accordance with S4 or S5 above, the runoff volume must be discharged at a rate that does not adversely affect flood risk.

SuDS components such as infiltration have been confirmed as not feasible due to the ground conditions still subject to investigation. Other SUDS measures including green roofs or rainwater harvesting may assist in constraining the volume of surface water runoff, these

have not been feasible due to proposed construction methods for the development, therefore S5 cannot be complied with.

4.4.3 Flood Risk Within Development

S7. The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on part of the site for a 1 in 30-year rainfall event.

S8. The drainage system must be designed so that, unless an is designated to hold and/or convey as part of the design, flooding does not occur during a 1 in 100-year rainfall event in any part of: a building (including a basement) or in any utility plant susceptible to water (e.g., pumping station or electricity substation within the development)

S9. The design of the site must ensure that so far as is reasonably practicable, flows resulting from rainfall in excess of a 1 in 100-year rainfall event are managed in exceedance routes that minimise the risks to people or property.

The drainage system proposed in service of this development shall attenuate the Surface water flows for up to the 100-year storm event without any flooding occurring in compliance with S7 & S8.

The levels of the proposed highways and properties are such that flooding in excess of the 100-year storm event provide exceedance flow routes away from properties to proposed and existing highways; satisfying the requirements of S9.

4.5 Future Maintenance

It is proposed that the surface and foul water drainage systems and Surface water systems will be a mixture of adopted and private, therefore some elements (manholes and oversized pipes) will be the responsibility of United Utilities, while others will be maintained by a responsible organisation as nominated by the developer; in accordance with the CIRIA SUDS Manual C753. Accordingly.

The S.W run off from the roofs and hard surfaces shall discharge by gravity to S.W sewers adopted and maintained by UU.

The SUDS porous pavements systems shall remain private and therefore be the responsibility of a resident's maintenance manage company as appointed responsible organisation in accordance with the CIRIA SUDS Manual C753.

Accordingly, as stated in the SUDS Manual the operation and maintenance of the SuDS system shall be as the the maintenance requirements for permeable paving are outlined within Table 20.15 of the CIRIA SUDS Manual C753. An extract of that table is given below to set out the maintenance schedule for the permeable/porous tarmac component of the proposed drainage systems.

TABLE 20.15 Operation and maintenance requirements for pervious pavements		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

The remaining drainage systems (Hydrobrake unit) will be maintained in accordance with manufacturer's requirements which will be provided within the O&M manual which will be issued as a compliance requirement to the maintenance contractor on completion of the works.

The hard surfaces proposed for the development that are not the responsibility of the householder shall require regular annual sweep and suction brush following leaf fall in autumn. An annual inspection of control chamber, ACO channels and the inspection chambers shall be necessary to remove any silt build up and check the free flow use of the hydrobrake.

4.6 Managing Residual Flood Risk

With the impermeable area surface water run off explicitly considered and accommodated by the proposed drainage system a consideration must be given to the remaining permeable area within the bounds of the site, comprised of communal garden areas. For the private garden areas surface water run-off will be mitigated by ensuring the top soil is freely draining and that at the lowest point of the garden a gravel trench should be in place to capture surface water for extreme events; with the surface water slowly dissipating post the storm event.

There is a finite risk that the design flood conditions required by current design standards are exceeded by an extreme and rare event. However, with the design measures reported such a risk is low and the exceedance flow path routes required to channel flows around the development buildings will be such that no specific flood risk management procedures are envisaged to be necessary. A Flood routing plan can be seen in Appendix H, that identifies the likely flow routes in extreme events, demonstrating that existing or proposed dwellings are not put at risk

5.0 Conclusions

- The site is located within flood zone 1 and has been deemed to have a low risk of flooding from rivers and not high flood risk from any other sources.
- Infiltration is currently not viable due to the ground conditions
- The surface water discharge from the proposed site should discharge at no more than the 5.0ls/ value for all storm events up to and including the 1 in 100-year event (+ 45% CC)
- The Surface water shall be contained within the attenuation system for the 1 in 100-year return period (+ 45% climate Change), ensuring that no properties are at risk of flooding and all flows are contained on site.

- The S.W network shall discharge into the existing combined manhole 8301 within Woodhouse Lane, with a 5.0l/s discharge from the network
- The S.W network represents the attenuation requirement based utilising online piped storage, to be adopted by United Utilities
- Foul water discharge from the proposed site should discharge, at unrestricted rate to the existing United Utilities Combined Water Sewer
- The F.W & S.W drainage systems shall combine within the development; prior to discharge to the Combined Sewer.
- Porous paving shall be installed on site, as a Source Control SuDS Measure.
- The proposed drainage systems comply with Standards contained within the LASOO Non-Statutory Technical Standards for Sustainable Drainage: Best Practice Guidance.

6.0 Recommendations

- The development shall have a S.W networks consisting of oversized pipes, manholes, a vortex flow control device should be utilised to restrict the surface water runoff and prevent any flooding for rainfall events up to and including the 1 in 100 year plus 45% climate change event.
- Infiltration testing in accordance with BRE 365 to confirm that discharge of S.W flows to ground is viable.
- The external ground levels around the proposed buildings shall fall away from the proposed building with any new levels being designed to ensure overland flood routes, for events in excess of the 100 Year + 45% CC, exit towards the highway, allowing for surface water risk mitigation and groundwater risk mitigation.
- The proposed scheme should be submitted to UU for technical review and adoption under a Section 104 Agreement.

Appendix A Site Location Plan

Notes
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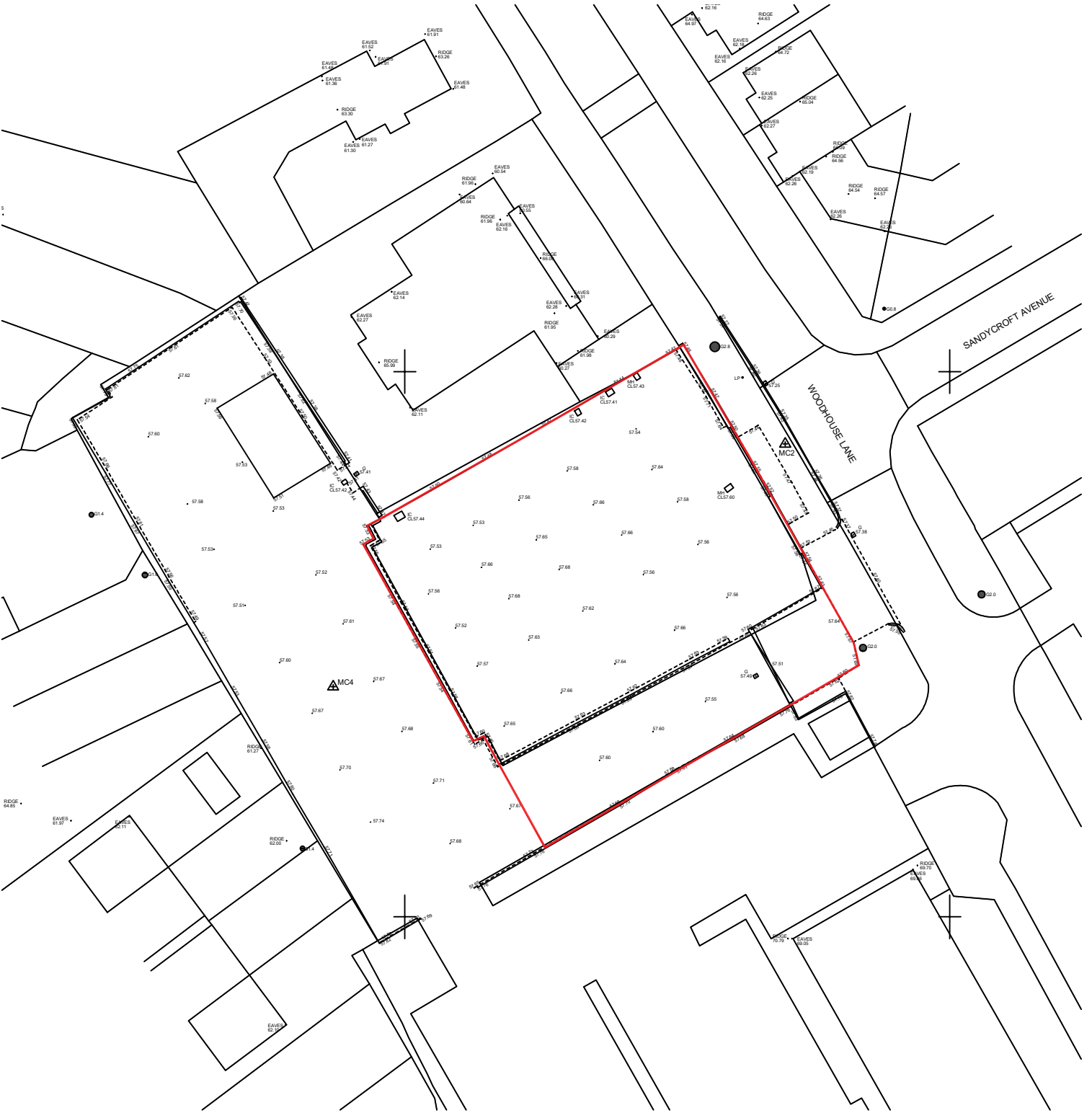
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- CHECK ALL DIMENSIONS ON SITE.
- DRAWING TO BE READ IN CONJUNCTION WITH HEALTH AND SAFETY PLAN AND ALL RELEVANT RISK ASSESSMENTS.

0 5 10 15 20
Scale in m. @ A4 1:500

Residual Risks

In addition to the hazard/risks normally associated with the types of work detailed on this drawing take note of the above. It is assumed that all works on this drawing will be carried out by a competent contractor working, where appropriate, to an appropriate method statement.
Safety Health and Environmental Information Box

RevID	Note	Date	Drwn	Chkd
P1	First Issue	15.02.23	-	-



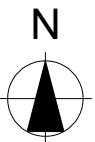
Project Name & No.
Former British Legion Site, Woodhouse Lane, Wythenshawe

Client
WCHG

Layout Title
Location Plan

number
6811-ARC-00-00-DR-A-010016

rev	drawn by	checked by	status
P1	SB	SB	S



Arcus Consulting LLP
www.arcus.uk.com
info@arcus.uk.com



Appendix B Aerial Photograph

Appendix C Topographic Survey

Appendix D Proposed Site Plan & Catchment Areas



Notes
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■ REPORT ERRORS & OMISSIONS TO ARCHITECT.
■ CHECK ALL DIMENSIONS ON SITE.
■ DRAWING TO BE READ IN CONJUNCTION WITH HEALTH AND SAFETY PLAN AND ALL RELEVANT RISK ASSESSMENTS.

RevID	Note	Date	Drwn	Chkd
P1	First Issue	27.04.23	SB	SB

0 5 10 15 20
Scale in m. @ A3 1:500

Residual Risks
In addition to the hazard/risks normally associated with the types of work detailed on this drawing take note of the above. It is assumed that all works on this drawing will be carried out by a competent contractor working, where appropriate, to an appropriate method statement.

Safety Health and Environmental Information Box

Project Name & Number
Former British Legion Site

Client
WCHG

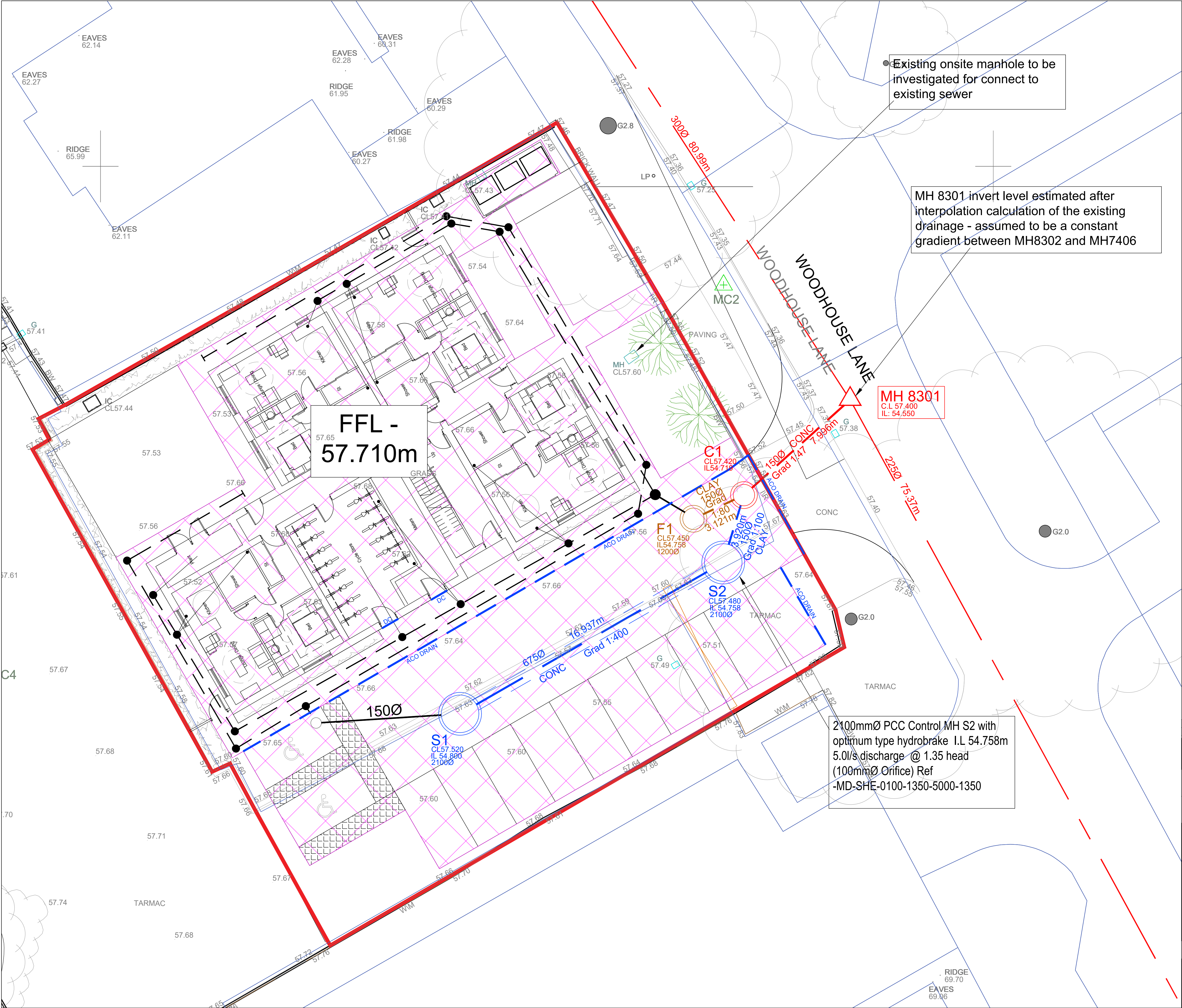
Layout Title
Proposed Site plan

N

number	rev	status	drawn by	checked
6811-ARC-00-00-DR-A-010001	P1	S3	SB	SB

Arcus Consulting LLP
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Newcastle 0191 2725781
Liverpool 0151 7081080
Cambridge 0122 3257706
Manchester 0161 9053222

QA35



Existing onsite manhole to be investigated for connect to existing sewer

MH 8301 invert level estimated after interpolation calculation of the existing drainage - assumed to be a constant gradient between MH8302 and MH7406

FFL - 57.710m

MH 8301
C.L 57.400
I.L: 54.550

2100mmØ PCC Control MH S2 with optimum type hydrobrake I.L 54.758m
5.0l/s discharge @ 1.35 head
(100mmØ Orifice) Ref
-MD-SHE-0100-1350-5000-1350

- GENERAL NOTES**
- SETTING OUT SHALL BE UNDERTAKEN USING ONLY THE INFORMATION GIVEN. DISTANCES SHOULD NOT BE SCALED FROM THIS DRAWING.
 - ALL SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DCG (THE CODE) AND UNITED UTILITIES DETAILS & GUIDELINES.
 - THE MINIMUM GRAVITY PIPE DIAMETER UNDER ADOPTABLE HIGHWAYS SHALL BE 150MM
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 - THE OUTSIDES OF ALL SEWERS SHALL BE A MINIMUM OF 1.0M FROM KERB LINES AND THE OUTSIDE OF MANHOLES SHALL BE A MINIMUM OF 0.5M FROM KERB LINES
 - EXISTING FLOWS IN WATERCOURSES, SEWERS AND LAND DRAINS SHALL BE MAINTAINED AT ALL TIMES 7. ONLY TRAINED PERSONNEL SHALL BE PERMITTED TO ENTER CONFINED SPACES
 - ALL MATERIALS TO BEAR THE RELEVANT B.S. KITEMARK AND COMPLY FULLY WITH THE SPECIFICATIONS. ALL CONCRETE & CONCRETE PRODUCTS MUST USE SULPHATE RESISTANT CEMENT (UNLESS THE SITE INVESTIGATION REPORT PROVES THAT SULPHATE ATTACK FROM SOILS AND GROUNDWATER WILL NOT OCCUR TO WITHSTAND A CLASS
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 - A CLASS 3 BED AND SURROUND MUST BE USED FOR SUCH PIPES. TRENCH BACKFILL IN HIGHWAYS TO WITHIN 1M OF HIGHWAY SHALL, AS DIRECTED BY THE HIGHWAY AUTHORITY BE A SUITABLE GRANULAR MATERIAL ALL IN ACCORDANCE WITH SEWERS FOR ADOPTION CL 4.3.4.12. SLAB LEVELS SHALL NOT BE VARIED WITHOUT REFERENCE TO THE ENGINEER FOR GUIDANCE
 - DOMESTIC DRAINAGE SHALL BE TO BUILDING REGULATIONS APPROVED DOCUMENT H: 110MM U.P.V.C. PIPES LAID TO THE FOLLOWING MINIMUM FALLS UNLESS OTHERWISE SHOWN.
- | | |
|-------------------|----------|
| FOUL | S.W. |
| HEAD RUN 1 IN 40 | 1 IN 60 |
| ELSEWHERE 1 IN 80 | 1 IN 100 |
- POLYPROPYLENE INSPECTION CHAMBERS TO BE PROVIDED TO ALL PRIVATE DRAINAGE LESS THAN 1.10m DEEP. WHERE PRIVATE DRAINAGE RUNS ARE DEEPER THAN 1.10m, REDUCED ACCESS CHAMBERS TO BE PROVIDED.
 - WHEREVER PLASTIC PIPES ARE TO BE USED FOR THE CONSTRUCTION OF ADOPTABLE DRAINAGE, STRUCTURED WALL PLASTIC PIPES MUST BE USED WHICH MUST COMPLY WITH BS EN 13476-1 AND WS 4-35-01
 - THE COLOURED DRAINAGE IS PROPOSED TO BE ADOPTED UNDER S104 AGREEMENT SUBJECT TO TECHNICAL APPROVAL

LEGEND

TOTAL IMPERMEABLE AREA 0.087 HA

REV	DATE	DESCRIPTION	BY	CHK	APP
DRAWING STATUS: PLANNING					
CLIENT: WCHG					
ARCHITECT: ARCUS CONSULTING					
PROJECT: BRITISH LEGION SITE WYTHENSHAW					
TITLE: SURFACE WATER CATCHMENT PLAN					
STATUS: S2	PROJECT No: 223-039	PROJECT: BLE - AJP - ZZ - 00 - DR - C - 1040	ORIGINATOR: AJP	VOL/SYS/LEVEL: P01	TYPE: DR
SCALE @ A1: 1:100	DESIGNED: JPR	DRAWN: JPR	CHECKED: JCM	APPROVED: JCM	DATE: JULY 2023
AJP consulting engineers 0151 227 1462 info@ajp ltd.co.uk 01 Dale Street, Liverpool, L2 2ET					

Appendix E Flood Risk Maps

Flood map for planning

Your reference
223-039 FZM

Location (easting/northing)
382818/387379

Created
24 Jul 2023 11:07

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

You will need to do a flood risk assessment if your site is **any of the following:**

- bigger than 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

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 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>

Flood map for planning

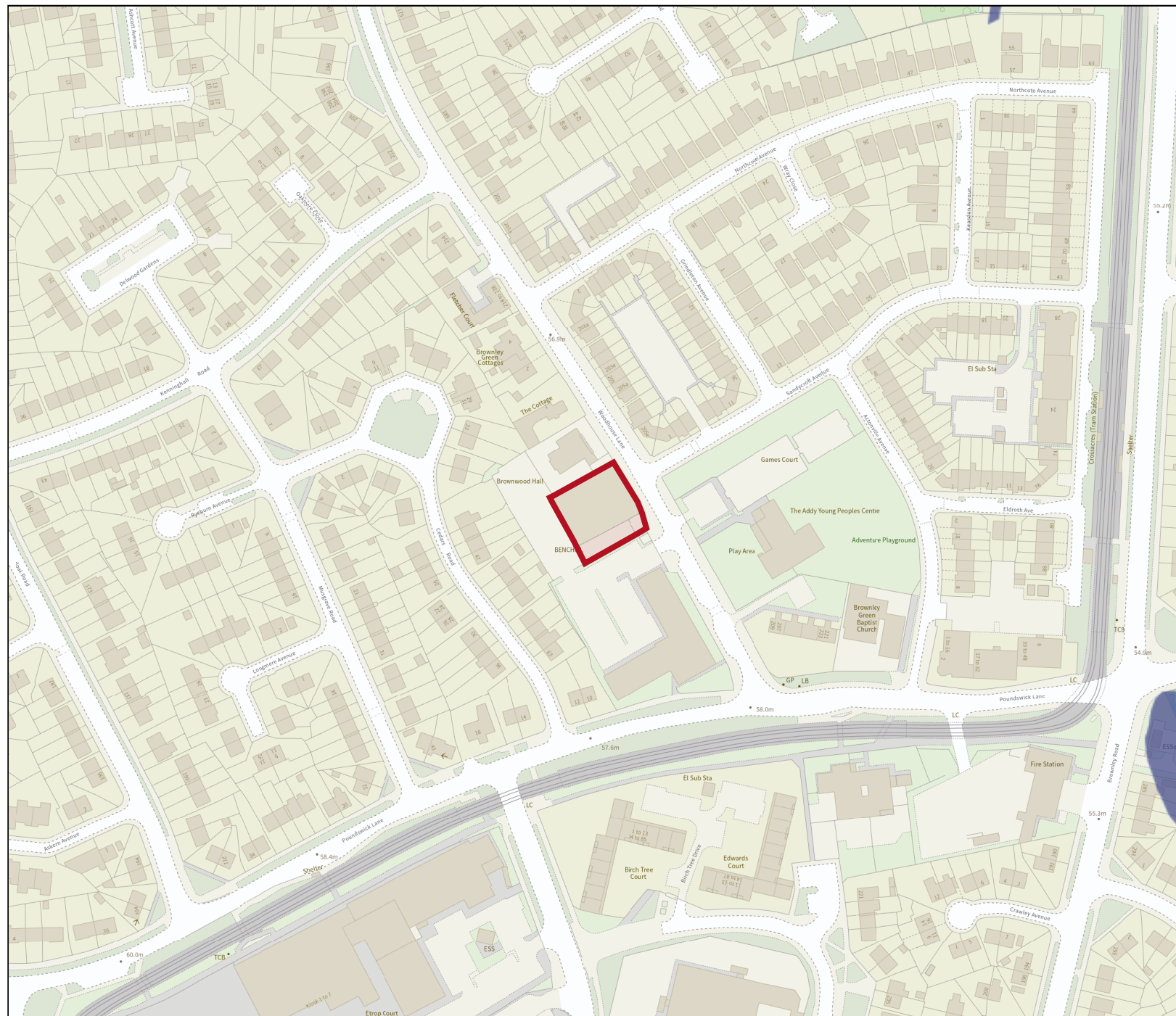
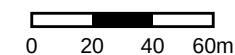
Your reference
223-039 FZM

Location (easting/northing)
382818/387379

Scale
1:2500

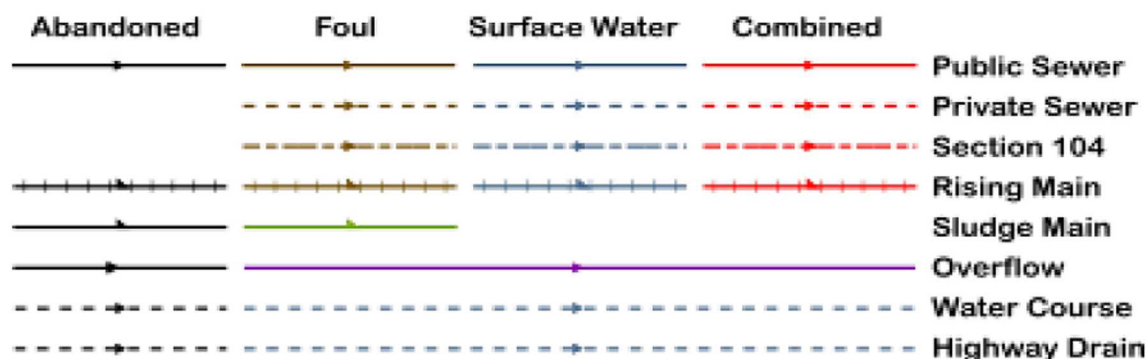
Created
24 Jul 2023 11:07

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area



Appendix F UU Maps

Wastewater Symbolology



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

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

SEWER RECORDS

Address or Site Reference

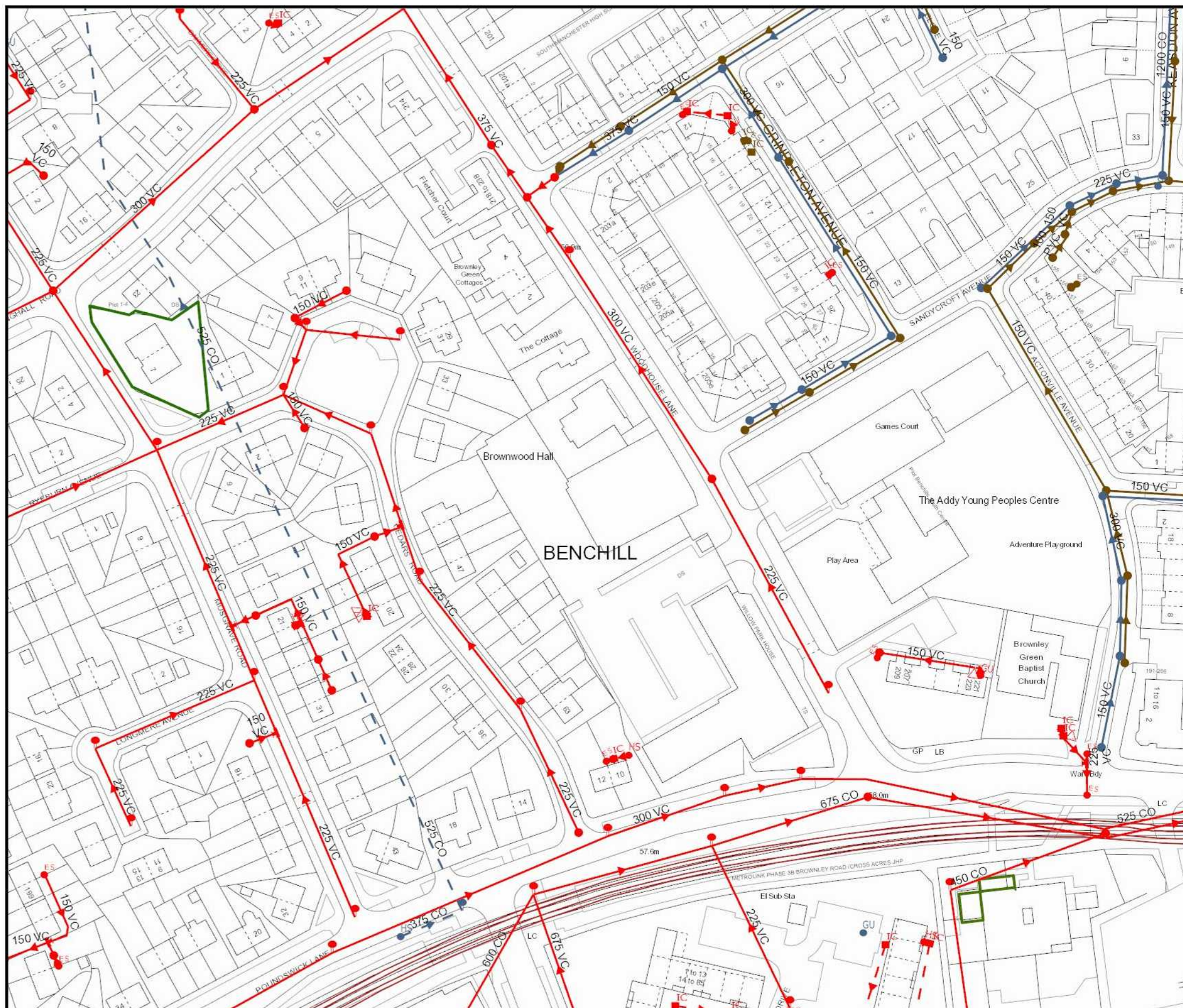
British Legion Site,

Scale: 1:1250
Date: 27/03/2023

Printed by: Property Searches

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

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Appendix G Existing & Proposed S.W Network Calculations

The Alan Johnston Partnership		Page 1
1 Dale Street Liverpool L2 2ET	British Legion Site Wythenshawe 223-039	
Date 01/07/2023 File	Designed by JPR Checked by JCM	
XP Solutions		
Source Control 2019.1		
<u>ICP SUDS Mean Annual Flood</u> Input Return Period (years) 100 Soil 0.450 Area (ha) 0.086 Urban 0.000 SAAR (mm) 805 Region Number Region 10 Results l/s QBAR Rural 0.4 QBAR Urban 0.4 Q100 years 0.9 Q1 year 0.4 Q30 years 0.8 Q100 years 0.9		
©1982-2019 Innovyze		

The Alan Johnston Partnership		Page 1
1 Dale Street Liverpool L2 2ET	British Legion Site Wythenshawe 223-039	
Date 01/07/2023 File 223-039 MICRDRAINAGE.MDX	Designed by JPR Checked by JCM	
XP Solutions	Network 2019.1	

Existing Network Details for Flow Path

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.000	16.937	0.042	400.0	0.087	5.00	0.0	0.600	o	675	Pipe/Conduit
1.001	3.920	0.039	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
1.002	7.996	0.169	47.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	54.800	0.087	0.0	1.30	466.7
1.001	54.758	0.087	0.0	1.00	17.8
1.002	54.719	0.087	0.0	1.47	25.9

Free Flowing Outfall Details for Flow Path

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
------------------------	-----------------	-----------------	-----------------	------------------------	-------------	-----------

1.002	Ex 8301	57.400	54.550	0.000	1500	0
-------	---------	--------	--------	-------	------	---

Simulation Criteria for Flow Path

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	0.000
Hot Start (mins)	0	Inlet Coefficient	0.500
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.000	Run Time (mins)	30
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	5

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	18.000	Storm Duration (mins)	15
Ratio R	0.389		

The Alan Johnston Partnership		Page 2
1 Dale Street Liverpool L2 2ET	British Legion Site Wythenshawe 223-039	
Date 01/07/2023 File 223-039 MICRODRAINAGE.MDX	Designed by JPR Checked by JCM	
XP Solutions	Network 2019.1	

Online Controls for Flow Path

Depth/Flow Relationship Manhole: S2, DS/PN: 1.001, Volume (m³): 15.2

Invert Level (m) 54.758

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.047	1.0650	0.419	4.9980	0.745	4.4490	1.071	4.4910
0.093	3.0790	0.466	4.9800	0.791	4.2260	1.117	4.5800
0.140	4.2060	0.512	4.9450	0.838	4.0110	1.164	4.6670
0.186	4.5240	0.559	4.8960	0.884	4.1120	1.210	4.7530
0.233	4.7570	0.605	4.8290	0.931	4.2100	1.257	4.8370
0.326	4.8900	0.652	4.7380	0.978	4.3060	1.303	4.9190
0.372	4.9950	0.698	4.6160	1.024	4.3990	1.350	5.0000

The Alan Johnston Partnership		Page 3
1 Dale Street Liverpool L2 2ET	British Legion Site Wythenshawe 223-039	
Date 01/07/2023 File 223-039 MICRODRAINAGE.MDX	Designed by JPR Checked by JCM	
XP Solutions	Network 2019.1	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Flow Path

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

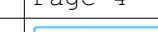
Synthetic Rainfall Details

```
Margin for Flood Risk Warning (mm) 300.0      DVD Status ON
      Analysis Timestep   Fine Inertia Status ON
      DTS Status          ON
```

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 45

PN	US/MH		Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water
	Name	Storm							Level (m)
1.000	S1	15 Winter	2	+0%	100/15 Summer				55.065
1.001	S2	15 Winter	2	+0%	2/15 Summer				55.064
1.002	C1	15 Winter	2	+0%					54.775

PN	US/MH Name	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Pipe	Status	Level
		Depth (m)	Volume (m³)			Flow (l/s)		Exceeded
1.000	S1	-0.410	0.000	0.04		11.6		OK
1.001	S2	0.156	0.000	0.62		4.8	SURCHARGED	
1.002	C1	-0.094	0.000	0.30		4.8		OK

The Alan Johnston Partnership		Page 4
1 Dale Street Liverpool L2 2ET	British Legion Site Wythenshawe 223-039	
Date 01/07/2023 File 223-039 MICRODRAINAGE.MDX	Designed by JPR Checked by JCM	
XP Solutions	Network 2019.1	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Flow Path

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

```
Margin for Flood Risk Warning (mm) 300.0      DVD Status ON
      Analysis Timestep   Fine Inertia Status ON
      DTS Status          ON
```

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 45

PN	US/MH		Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water
	Name	Storm							Level (m)
1.000	S1	30 Winter	30	+0%	100/15 Summer				55.432
1.001	S2	30 Winter	30	+0%	2/15 Summer				55.422
1.002	C1	15 Winter	30	+0%					54.776

PN	US/MH	Surcharged	Flooded			Pipe	Status	Level Exceeded
	Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)		
1.000	S1	-0.043	0.000	0.06		17.1	OK	
1.001	S2	0.514	0.000	0.64		5.0	SURCHARGED	
1.002	C1	-0.093	0.000	0.31		5.0	OK	

The Alan Johnston Partnership		Page 5
1 Dale Street Liverpool L2 2ET	British Legion Site Wythenshawe 223-039	
Date 01/07/2023 File 223-039 MICRODRAINAGE.MDX	Designed by JPR Checked by JCM	
XP Solutions	Network 2019.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Flow Path

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.500
 Manhole Headloss Coeff (Global) 0.000 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 0
 Number of Online Controls 1 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.389
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 18.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
 Analysis Timestep Fine Inertia Status ON
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 0, 45

	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level
1.000	S1	60 Winter	100	+45%	100/15	Summer			57.359
1.001	S2	60 Winter	100	+45%	2/15	Summer			57.359
1.002	C1	30 Summer	100	+45%					54.776

	US/MH	Depth	Volume	Flow / Overflow	Pipe		Level
PN	Name	(m)	(m³)	Cap. (l/s)	Flow (l/s)	Status	Exceeded
1.000	S1	1.884	0.000	0.06	18.7	FLOOD RISK	
1.001	S2	2.451	0.000	0.64	5.0	FLOOD RISK	
1.002	C1	-0.093	0.000	0.31	5.0	OK	

Appendix H Outline Drainage Strategy

OUTLINE DRAINAGE STRATEGY FOR THE BRITISH LEGION SITE IN WYTHENSHAW IS BASED UPON PROPOSED FLOWS DISCHARGING TO C.W SEWER WITHIN WOODHOUSE LANE VIA 150mm DIAMETER BRANCH CONNECTION AT MH 8301

TOTAL SITE AREA = 0.117HA
RESTRICTED DISCHARGE FOR DEVELOPMENT = 5l/s
BASED ON IMPERMEABLE AREA TOTAL AREA TO BE DRAINED = 0.087ha
PROPOSED DISCHARGE RATES :
2YR = 4.8 L/S
30 YR = 5.0 L/S
100 YR + 45% CC = 5.0 l/s

ICP SuDs MEAN ANNUAL FLOOD RESULTS:
Q30 - 0.8l/s
Q100 - 0.9l/s

DRAINAGE STRATEGY INCLUDING DISCHARGE RATES AND POINT OF DISCHARGE TO BE AGREED WITH UNITED UTILITIES AND THE LEAD LOCAL FLOOD AUTHORITY

Existing onsite manhole to be investigated for connect to existing sewer

MH 8301 invert level estimated after interpolation calculation of the existing drainage - assumed to be a constant gradient between MH8302 and MH7406

FFL -
57.710m

MH 8301
C.L 57.400
I.L: 54.550

2100mmØ PCC Control MH S2 with optimum type hydrobrake I.L 54.758m
5.0l/s discharge @ 1.35 head
(100mmØ Orifice) Ref
-MD-SHE-0100-1350-5000-1350

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- THE MINIMUM GRAVITY PIPE DIAMETER UNDER ADAPTABLE HIGHWAYS SHALL BE 150MM
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- THE OUTSIDES OF ALL SEWERS SHALL BE A MINIMUM OF 1.0M FROM KERB LINES AND THE OUTSIDE OF MANHOLES SHALL BE A MINIMUM OF 0.5M FROM KERB LINES
- EXISTING FLOWS IN WATERCOURSES, SEWERS AND LAND DRAINS SHALL BE MAINTAINED AT ALL TIMES. ONLY TRAINED PERSONNEL SHALL BE PERMITTED TO ENTER CONFINED SPACES
- ALL MATERIALS TO BEAR THE RELEVANT B.S. KITEMARK AND COMPLY FULLY WITH THE SPECIFICATIONS. ALL CONCRETE & CONCRETE PRODUCTS MUST USE SULPHATE RESISTANT CEMENT (UNLESS THE SITE INVESTIGATION REPORT PROVES THAT SULPHATE ATTACK FROM SOILS AND GROUNDWATER WILL NOT OCCUR TO WITHSTAND A CLASS
- ALL OPENING NOTICES ETC. AS REQUIRED UNDER HIGHWAYS ACTS ETC. ARE TO BE OBTAINED PRIOR TO COMMENCEMENT OF WORKS. ALL WORKS ARE TO BE INSPECTED BY L.A., NHBC OR THE NETWORK OPERATOR AS APPLICABLE.
- WHERE 'ULTRA RIB' UPVIC PIPES (OR SIMILAR APPROVED) ARE USED IN ADAPTABLE DRAINAGE THEY SHALL STILL BE HANDLED AND LAID IN ACCORDANCE WITH THE SPECIFICATION AND GUIDANCE ISSUED BY THE HIGH PERFORMANCE PIPE ASSOCIATION.
- A CLASS 3 BED AND SURROUND MUST BE USED FOR SUCH PIPES. TRENCH BACKFILL IN HIGHWAYS TO WITHIN 1M OF HIGHWAY SHALL, AS DIRECTED BY THE HIGHWAY AUTHORITY BE A SUITABLE GRANULAR MATERIAL ALL IN ACCORDANCE WITH SEWERS FOR ADOPTION CL 4.3.4.12. SLAB LEVELS SHALL NOT BE VARIED WITHOUT REFERENCE TO THE ENGINEER FOR GUIDANCE
- DOMESTIC DRAINAGE SHALL BE TO BUILDING REGULATIONS APPROVED DOCUMENT H: 110MM U.P.V.C. PIPES LAID TO THE FOLLOWING MINIMUM FALLS UNLESS OTHERWISE SHOWN.

FOUL	S.W.
HEAD RUN 1 IN 40	1 IN 60
ELSEWHERE 1 IN 80	1 IN 100
- POLYPROPYLENE INSPECTION CHAMBERS TO BE PROVIDED TO ALL PRIVATE DRAINAGE LESS THAN 1.10m DEEP. WHERE PRIVATE DRAINAGE RUNS ARE DEEPER THAN 1.10m, REDUCED ACCESS CHAMBERS TO BE PROVIDED.
- WHEREVER PLASTIC PIPES ARE TO BE USED FOR THE CONSTRUCTION OF ADAPTABLE DRAINAGE, STRUCTURED WALL PLASTIC PIPES MUST BE USED WHICH MUST COMPLY WITH BS EN 13476-1 AND WS 4-35-01
- THE COLOURED DRAINAGE IS PROPOSED TO BE ADOPTED UNDER S104 AGREEMENT SUBJECT TO TECHNICAL APPROVAL

LEGEND

- PROPOSED SURFACE WATER SEWER MANHOLE
- PROPOSED FOUL WATER SEWER MANHOLE
- PROPOSED COMBINED SEWER MANHOLE
- EXISTING GROUND LEVELS
- EXISTING SURFACE WATER MANHOLE
- EXISTING FOUL WATER MANHOLE
- EXISTING COMBINED WATER MANHOLE
- PROPOSED FOUL 600MMØ PPIC DRAG OUT MH (TBC WITH UU FIELD INSPECTOR)
- PROPOSED SURFACE WATER 600MMØ PPIC DRAG OUT MH WITH HEAVY DUTY COVER(TBC WITH UU FIELD INSPECTOR)
- PROPOSED SURFACE WATER DRAIN WITH 450mmØ INSPECTION CHAMBER
- PROPOSED FOUL WATER DRAIN WITH 450mmØ INSPECTION CHAMBER
- 25.000 FINISHED FLOOR LEVEL
- DISHED CHANNEL (OR SIMILAR)
- 3.0m/3.5m EASEMENT EITHER SIDE OF SURFACE WATER SEWER

REV	DATE	DESCRIPTION	BY	CHK	APP
DRAWING STATUS: PLANNING					
CLIENT: WCHG					
ARCHITECT: ARCUS CONSULTING					
PROJECT: BRITISH LEGION SITE WYTHENSHAW					
TITLE: OUTLINE DRAINAGE LAYOUT					
STATUS: S2	PROJECT No: 223-039	PROJECT: BLE - AJP - ZZ - 00 - DR - C - 1000	ORIGINATOR: AJP	VOL/ISSY/LEVEL: P01	TYPE: DR
SCALE @ A1: 1:100	DESIGNED: JPR	DRAWN: JPR	CHECKED: JCM	APPROVED: JCM	DATE: JULY 2023
AJP consulting engineers 0151 227 1462 info@ajp Ltd. 01 Dale Street, Liverpool, L2 2ET					

