

**902 WILMSLOW ROAD
MANCHESTER**

RESIDENTIAL DEVELOPMENT

FLOOD RISK ASSESMENT

VOLUME 1

REVISION S1

Prepared for

AM7 GROUP

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PROJECT 7244

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DUTY OF CARE

This report was prepared on behalf of the clients, AM7 Group, in response to a specific brief. No reliance is to be placed on the content of this report for any use other than that for which it was prepared. This report has been prepared in the light of Legislation and best practice current at the time of writing.

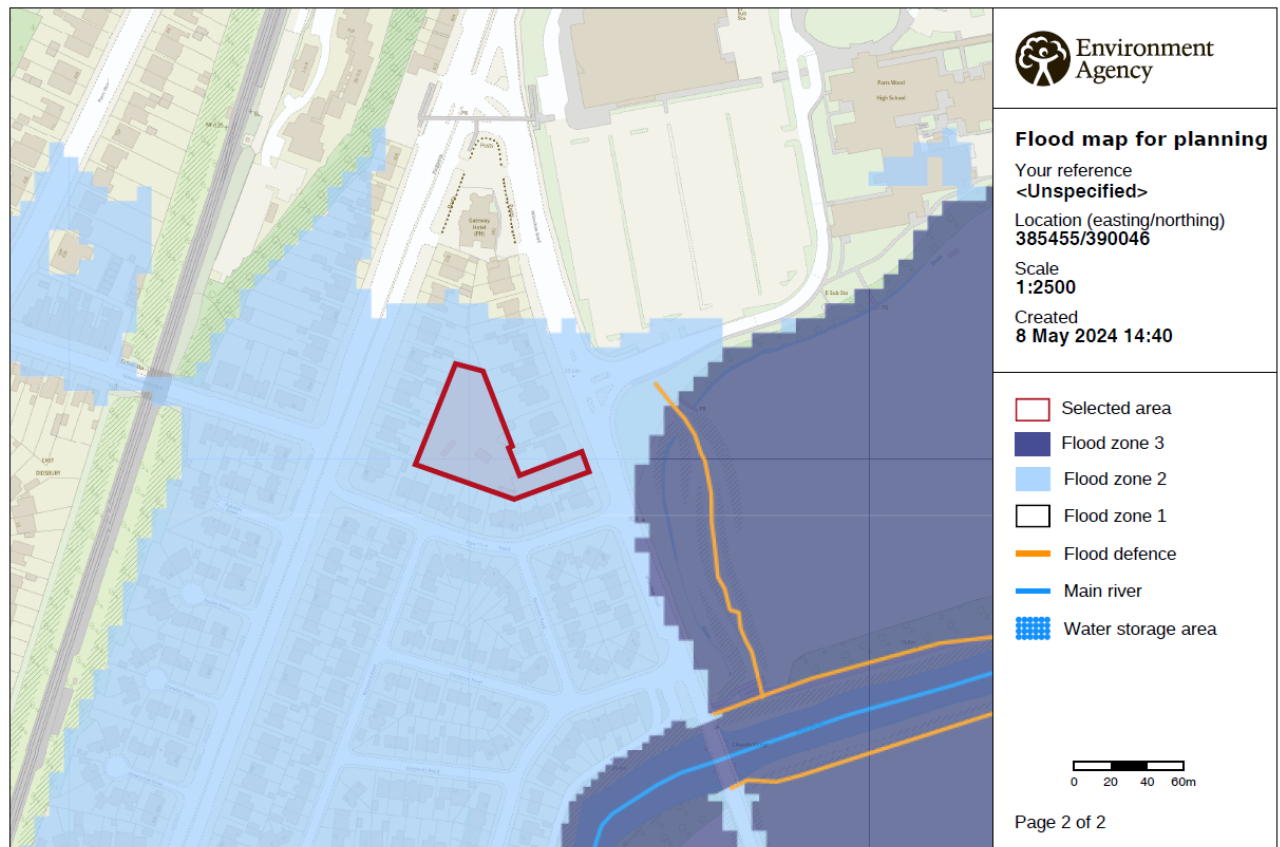
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Figure 2.3: adopted sewers around the site

The Environment Agency website has been consulted during the preparation of this report.

Environment Agency Flood Mapping indicates that the site is located in Flood Zone 2 (medium probability of flooding). Flood Zone 2 land has been assessed as having a 1.0 - 0.1% (1 in 100 to 1 in 1000 year) chance of flooding from rivers. The location of the site is outlined in red on the plan below.



Flood Map for Planning reproduced from the Environment Agency website. The location of the site under consideration is outlined in red

Environment Agency advice for developments indicates that a flood risk assessment (FRA) will normally be required for a site in Flood Zone 2.

The Environment Agency provided information relating to flood levels at the site relating to events with and without defences in place and with the impact for climate change. These are contained in Appendix B.

Proposals for surface water management should seek to maintain, or where practicable reduce, the rate of run-off from the site taking into account the potential for climate change.

Environment Agency guidance on flood risk recommends that surface water runoff should be controlled as near to its source as possible through a sustainable drainage approach to surface water management (SUDS), including the use of soakaways, infiltration trenches,

permeable pavements and grassed swales to reduce flood risk by attenuating the rate and quantity of surface water runoff from the site.

2.0 FLOOD RISK ASSESSMENT

2.1. Site Location and Description

The site is formed by a parcel of land that is almost triangular in plan located in Parrs Wood, Manchester and bounded by houses that front onto Kingsway, Wilmslow Road and Moor Park Road with The Gateway public house located immediately to the north of the site. The postcode of the site is M20 5PA, Parrs Wood, Manchester and it will be accessed via a road leading from Wilmslow Road that is located to the east of the site.

The site is centred around NGR co-ordinates 385400, 390000

The site is triangular in shape, site area is approximately 0.30 hectares. A strip of land connects the development area to the A34 located to west of the site. A topographical survey has not been undertaken but from a site walk over and inspection of various digital references the area is broadly flat and with limited falls across the site. Levels in the road around the site are recorded in some areas as 34.1m AOD. Allowing for a nominal kerb upstand of 125mm and a cross fall across any pavement of say 50mm would give an indicative site level of around 34.275m AOD.

The boundaries are formed as follows:

- The northern boundary is formed by gardens to houses fronting onto Kingsway and those facing Wilmslow Road. These houses and gardens are located immediately south of The Gateway public house.
- The eastern site boundary is formed by gardens to houses that front onto Wilmslow Road.
- A road, now overgrown and not accessible serves the site on the eastern boundary from Wilmslow Road.
- The western site boundary is formed by gardens to houses that front on the A34 – Kingsway.
- The southern site boundary is formed by garden to houses that front onto Moor Park Road.

Water bodies in the vicinity of the site include:

- The River Mersey that is designated a Main River and is located approximately 150m south of the site
- A minor ditch that runs parallel to Wilmslow Road located approximately 75m from the main body of the site.
- Flood defense systems are in place located approximately 50m from the perimeter of the site.



Figure 2.1: Aerial image showing the local area and current site layout (site outlined in red)

2.1.b Vulnerability classification

Residential development is classed as a 'more vulnerable' use, as classified in Table 2 in the on-line 'Planning Practice Guidance' (Paragraph: 066 Reference ID: 7-066-20140306, revision date 6/3/2014).

2.1.c Local Development Documents

The site located at Parrs Wood falls under the Manchester City Council local development framework. The current local development documents comprise the following statutory documents:

- Manchester Core Strategy, adopted 11 July 2012, is the key Development Plan in the Local Development Framework and replaces large parts of the Unitary Development Plan.
- The Core Strategy was updated in following adoption of Places for Everyone Joint Development Plan in March 2024. The amended Manchester Core Strategy 2024 must be read alongside the Core Strategy.
- The core strategy contains Policy EN 14 - Flood risk that requires:

In line with the risk-based sequential approach contained within PPS25, development should be directed away from sites at the greatest risk of flooding, and towards sites with little or no risk of flooding; this should take account of all sources

of flooding identified in the Manchester-Salford-Trafford Strategic Flood Risk Assessment (SFRA).

In addition to the requirements for site-specific Flood Risk Assessments (FRAs) set out in PPS25, an appropriate FRA will also be required for all development proposals, including changes of use, on sites greater than 0.5ha within Critical Drainage Areas (CDAs) and Canal Hazard Zones identified in the SFRA.

All new development should minimise surface water run-off, including through Sustainable Drainage Systems (SUDS) and the appropriate use of Green Infrastructure. Developers should have regard to the surface water run-off rates in the SFRA User Guide. In CDAs, evidence to justify the surface water run-off approach / rates will be required.

The City of Manchester contains many sections of rivers which are culverted or 'hidden'; where these are indicated in the SFRA beneath the proposed development site, further investigation will be required and the development proposal should take this into account; where feasible and appropriate development should seek to open up culverted/hidden rivers to reduce the associated flood risk and danger of collapse, taking advantage of opportunities to enhance biodiversity and Green Infrastructure.

2.1.d Evidence that the Sequential Test or Exception Test has been applied in the selection of this site for this development type.

Local Planning Authorities should have regard to flood risk across the whole of their areas, including places outside the neighbourhood planning area which may be at lower risk of flooding and which are suitable and reasonably available for the proposed development.

The Sequential and Exception Tests are applied for sites where flood risk is outweighed by wider sustainability considerations and is designed to ensure that the flood risk posed to such sites is controlled and mitigated to an acceptable level taking account of climate change. (Planning Practice Guidance Paragraph: 063 Reference ID: 7-063-20140306, revised 6/3/2014)

The risk-based Sequential Test aims to steer new developments towards areas with the lowest probability of flooding (i.e. Flood Zone 1), taking into account the likelihood of flooding from all potential sources, not just rivers and the sea. (Planning Practice Guidance Paragraph: 033 Reference ID: 7-033-20140306).

Environment Agency mapping indicates that the proposed site lies within Flood Zone 2. The development of residential buildings within flood Zone 2 is appropriate. Sequential testing has been carried out for the site, that demonstrates that there are no alternative lower risk site available where this development could take place.

The Exception Test requires that the development provides wider sustainability benefits to the community which must outweigh the flood risk. (Planning Practice Guidance Paragraph: 021 Reference ID: 7-021-20140306, revised 6/3/2014).

For the Exception Test to be passed it must be demonstrated that:

- a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and
- b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

The proposed drainage strategy and flood protection measures will ensure that the development will remain safe for its lifetime and reduce the flood risk overall, please refer to sections 2.6 and 2.7 of this report for further detail. The proposed development at the site passes the Exception Test.

2.2 Definition of the Flood Hazard

2.2.a What sources of flooding could affect the site?

Consideration has been given to the possibility of flooding that could affect the site from sources such as rivers, the sea, reservoirs and other artificial sources, groundwater, sewers and surface water runoff.

2.2.b For each identified source, describe how flooding would occur, with reference to any historic records wherever these are available.

Fluvial and Tidal Flooding

Environment Agency Flood Mapping indicates the site is located within EA Flood Zone “. EA Flood Zone 2 land has been assessed as having a medium risk of flooding between 0.1% (1 in 1000 year) 1.0% (1 in 100) and chance of flooding from rivers and an annual probability of sea flooding between 0.5% (1 in 200 year) and 0.1% (1 in 100 year).

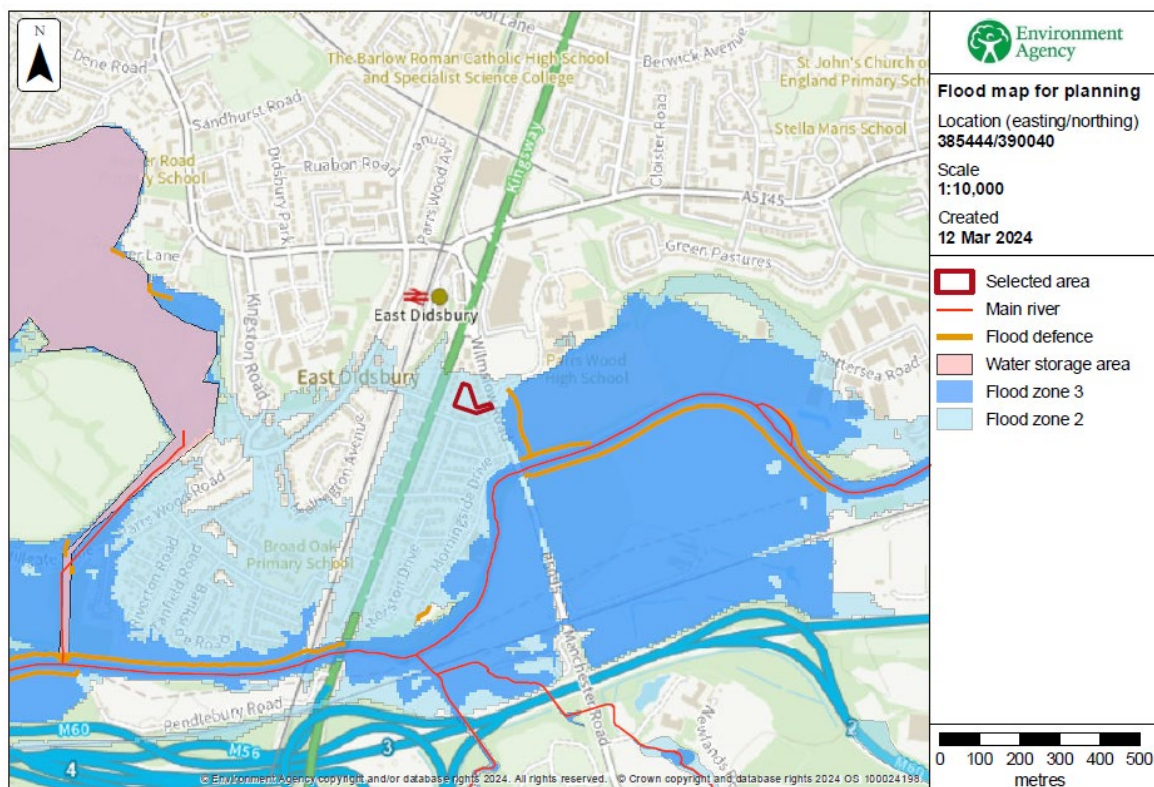


Figure 2.2: EA Flood Map for Planning

The risk of tidal flooding on the site is generally considered to be low.

Sub surface North West prepares a desk top survey of the site dated March 2024. See Appendix C. The Sub Surface report has indicated that: *since records began in 1946, there are three records of historical floods between 18 metres to the east and 173 metres to the south east. The most recent flood, in Didsbury, occurred in 2021.*

There are four flood defences, the nearest being 54 metres to the east, one area benefitting from flood defences 198 metres to the south east and no flood storage areas present within 250 metres of the site boundary.

Flooding from reservoirs, canals and other artificial sources

Examination of public records and maps has not revealed the presence of reservoirs in the close vicinity of the site or known records of flooding from artificial sources at the site. Flooding from these sources is therefore considered to be unlikely.

Flooding from Groundwater

Based on a review of Sub Surface North West geological appraisal, *Drift deposits, described as River Terrace deposits, comprising sand and gravel, are indicated to be present within the site, the depth of which is unknown. The maximum permeability for these deposits is indicated to be very high and the minimum permeability is indicated to be high.*

In addition, drift deposits, described as Alluvium, comprising clay, silt, sand and gravel are indicated to be about 31 metres to the east of the site boundary, the depth of which is unknown.

No intrusive site investigation has been undertaken therefore the actual nature of the underlying variable soils remains unknown.

The Sub Surface report confirms that: *Groundwater flooding is caused when the water table rises in areas where this is usually at shallow depth. Ambient Risk Analytics indicate that there is a moderate to high risk of groundwater flooding on the site and within 50 metres of the site boundary.*

Flooding from Sewers

United Utilities Wastewater Developer Services confirmed on 11th March 2024 that they have no current record of sewer flooding within the vicinity of the proposed development.

The risk of flooding from foul and surface water drainage systems is considered low

A new drainage network will be designed and installed at the site and therefore the risk of flooding from foul and surface water drainage systems is considered low.

There may be a residual risk of flooding associated with blockages in the site drainage systems or main sewers.

Flooding from Surface water run-off - Overland flow

The EA Flood Map for Planning indicates that the nearest surface water features are the watercourse approximately 50m from the western boundary.

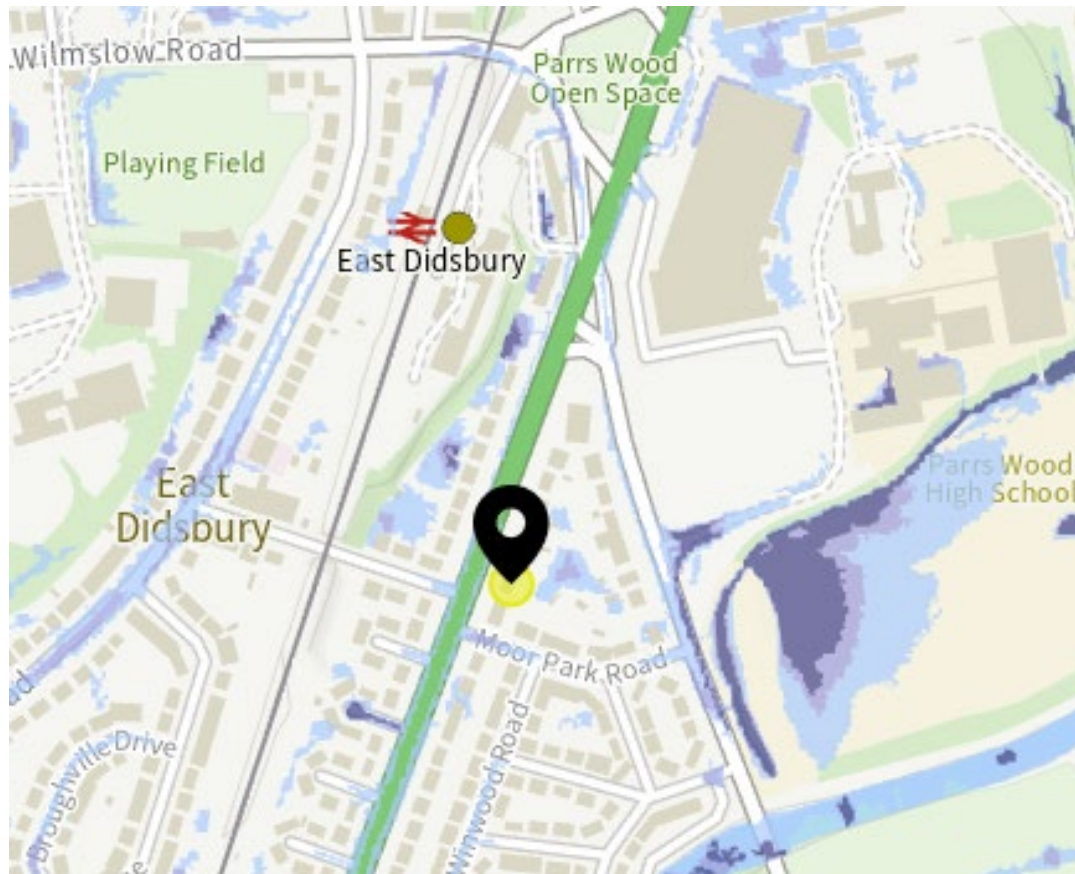


Figure 2.2: Surface water flood mapping of a low risk situation reproduced from the Gov UK website.

The EA website classifies the area as having a very low risk of Surface water flooding. Very low risk is classified as less than 0.1%.

EA Surface Water Flood Mapping indicates that there is low risk of minor surface water flooding. This limited surface water flooding indicated on the mapping is most likely to be the result of accumulation of run off in low lying areas of the site and the low permeability of the drift deposits. This is something that would be dealt with by normal surface water and land drainage provision as part of any development proposals for the site. In addition, ground floor levels across the development will be raised above the level of any potential surface water run off and overland flow.

The new development will be provided with a surface water drainage system designed for a 1 in 100-year storm event and a 40% increase in peak rainfall intensity to accommodate climate change. Discharge from the site will be attenuated and all run off will be contained within the below ground network. The development will not increase the likelihood of flooding from overland on site or in the surrounding area.

Flooding from surface water runoff is not considered to represent a significant risk at the site.

2.2.c Existing surface water drainage arrangements for the site

The total area of the development site as defined by the red line planning boundary is in the region of 1.3 hectares.

United Utilities records indicate that there is combined sewer infrastructure around the site but no surface water connections to the adopted network has been established. Enquiries and investigations on site are being undertaken to confirm this.

2.3 Probability of Flooding

2.3.a Which flood zone is the site located in?

Environment Agency mapping indicates that the site is in Flood Zone 2.

2.3.b If there is a SFRA covering this site, what does it show?

Manchester City Councils acts as the Lead Local Flood Authority for the area.

Manchester City, Salford City and Trafford Council Level 1 Hybrid SFRA was published in March 2010. The Level 1 SFRA has used mostly existing data to make an assessment of flood risk from all sources now and in the future and. It looks at the risk of flooding from rivers, canals, reservoirs, groundwater and surface water / sewers.

The Level 2 Hybrid SFRA that was published in March 2011. The Level 2 SFRA provides more detailed information on flood risk from rivers (The Lower Irwell, Grey Irwell, Rivers Irk, Medlock and Mersey and the Corn Brook), canals (Manchester Ship Canal and the Bridgewater, Rochdale and Ashton Canals) and surface water / sewers. It also looks at the impacts of development on flood risk and the interactions between different sources of flooding. The additional detail can also inform a sequential approach to development allocation within flood risk areas, the likelihood of sites passing the Exception Test and mitigation options where appropriate.

The key objectives of a SFRA are to:

- Investigate and identify the extent and severity of flood risk to the area at present and in the future.
- Contribute to the Council's Sustainability Appraisal.
- Enable the Council to apply the Sequential Test and the Exception Test.
- Provide strategic flood risk guidance and advice to planners and developers.
- Help local planning authorities to identify specific locations where further and more detailed flood risk data and assessment work is required.
- Identify the level of detail required for site-specific Flood Risk Assessments (FRAs).
- Inform the emergency planning process.
- Improve stakeholder joint working and the sharing of data, information and the understanding of flood risk.
- Provide a reference document

2.3.c What is the probability of the site flooding taking account of the contents of the SFRA and any further site-specific assessment?

The probability of flooding from the various sources set out in section 2.2 is summarised in the table below

Source of Flooding	Probability of Flooding
Fluvial and Tidal	Medium Probability (1 in 100 to 1 in 100 annual probability)
Reservoirs and Canals	Low Probability - Unlikely
Groundwater	Medium to High Probability – some potential
Sewers	Low Probability - unlikely
Surface Water run-off and Overland Flow	Low Probability (1 in 1000 annual probability)

Preliminary assessment of the site and surrounding area has and confirmed a low probability of flooding from all sources.

2.3.d Existing rates of run-off generated by the site

The site is currently 'Greenfield' and is not thought to connect to the surface water infrastructure.

Consideration therefore been given to the green field run off. The green field run off from the site has been assessed using Info Drainage software for a catchment of 0.3 hectares as shown in below.

UK and Ireland Rural Runoff Calculator

ICP SUDS / IH 124 ADAS 345 FEH ReFH2 Greenfield Volume

Method: ☒ ICP SUDS ☐ IH 124

Area (ha):

SAAR (mm):

Soil:

Region:

Additional Options

Urban:

Return Period (years):

Growth Curve:

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 100 (years) (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 10	0.7	0.7	1.4	0.6	1.1	1.4

The green field run off has been assessed as 1.4 l/sec.

2.4 Climate Change

Allowances for climate change were updated by the Environment Agency in February 2016. The proposed development is for residential accommodation and is assumed to have a lifetime of 100 Years. as per National Planning Guidance Paragraph: 026 Reference ID: 7-026-20140306, dated 6/3/14.

The implications of climate change should be considered in relation to surface water drainage. Peak rainfall intensity for medium lifetime residential development is estimated to increase 40% as a result of climate change. It is therefore recommended that the allowance of 40% is applied to the design rainfall intensity to allow for the potential implications of climate change.

The proposed surface water drainage system should be designed to accommodate the 1 in 30-year rainfall event without any surface water flooding and should be able to retain the 1 in 100-year plus climate change storm event on site without flooding any buildings. Climate change should be allowed for in the detailed surface water design calculations as an additional 40% increase in peak rainfall intensity.

There is an Environment Agency aspiration to intercept the first 5mm of rainfall falling on any site and divert it away from piped drainage systems. This may be difficult to achieve as the superficial strata across the site generally comprise cohesive clays. SUDs infiltration techniques may not be suitable for the site.

2.5.b Where appropriate, demonstrate how land uses most sensitive to flood damage have been placed in areas within the site that are at least risk of flooding

The site is located within Flood Zone 2. The proposed development is designated 'more vulnerable' by the National Planning Policy Framework Annex 3 Table 1.

Table 2 of the policy is reproduced below. This sets out that residential development with a Zone 2 flood risk area is acceptable.

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.

Table 2 of National Planning Policy Framework Annex 3

2.6 Flood Risk Management Measures

2.6.a How will the site be protected from flooding, including the potential impact of climate change, over the development's lifetime?

The site has been assessed as having a medium possibility of flooding from fluvial sources and low to medium probability of flooding from groundwater. All other sources of flooding are considered to be low risk.

The site is protected from flooding by flood protection systems that comprise of embankments, engineered high ground and walls that are reported as being in good to fair condition.

Based on initial EA data, 1 in 1000 year plus climate change flood levels at the site are anticipated to be around 35.9m

The site lies within Flood Zone 2 so a system of protections will be included in the development of the design including setting minimum finished floor levels above flood water levels to protect the buildings against flooding, providing safe access to and from the site during flooding and the selection of flood resistant and resilient materials in construction generally in accordance with CIRIA Code of Practice for Floor Resilience (C790F).

Based on 1 in 100 year plus climate change, floor levels would be set around 300mm above this level, giving a general finished floor level of around 36.200m. Voids would be created below the ground floor slabs of the units that would act as a sump to provide storm water storage and to reduce the impact on the nett stormwater storage.

In order to protect the site and surrounding area from flooding a number of measures will be adopted in design of the surface water drainage to the proposed development.

Where possible, the drainage will be designed to adopt the principles of SuDS as set out in the SuDS Manual (C753)

The surface water drainage systems for the new development will be designed to accommodate 1 in 100 years storm events allowance for 40% increase in peak rainfall intensity to accommodate climate change over the life of the development. This will protect the development and adjacent sites from the risk of surface water flooding and overland flow.

2.7 Off Site Impacts

2.7.a How will you ensure that your proposed development and the measures to protect your site from flooding will not increase flood risk elsewhere?

The drainage and attenuation system will be designed to accommodate 1 in 100 years storm events allowance for 40% increase in peak rainfall intensity without overland flow. The proposed development will not increase flood risk on or off site.

2.7.b How will you prevent run-off from the completed development causing an impact elsewhere?

See measures set out in section 2.7a above.

2.8 Residual Risks

2.8.a What flood related risks will remain after you have implemented the measures to protect the site from flooding?

A residual risk will exist from the moderate possibility of fluvial flooding caused by an by extreme storm events with annual probabilities of between 0.5% (1 in 200 year) and 1% (1 in 100 year).

There may also be a residual risk of flooding associated with blockages in the site drainage systems or main sewers around the site.

2.8.b How, and by whom, will these risks be managed over the lifetime of the development?

The management of the on-site SuDS systems is the responsibility of the owners. The approved drainage plan must include the safe operation and maintenance of SUDS. Where appropriate this must make provision for a warning system and contingency arrangements. The owners should ensure that the systems are properly maintained and kept free of debris which will prevent them operating efficiently. CIRIA SuDS Manual (C753) provides guidance on the principles of good practice for the management of waste resulting from the maintenance of SuDS.

Reference should also be made to British Standard BS 8582:2013: Code of practice for surface water management for development sites regarding the maintenance requirements and programming for maintenance to surface water drainage systems.

3.0 PROPOSED HIGH LEVEL SURFACE WATER DRAINAGE STRATEGY

3.1 Existing drainage arrangements

The proposed development site covers an area of approximately 0.3 hectares and is currently considered 'greenfield' comprising overgrown vegetation and some derelict lightweight buildings and sheds.

There is limited evidence of any existing drainage connections from the site, but these are being investigated further. See TRP Consulting's Site Walkover Report dated April 2024 in Appendix D.

3.2 Existing Run Off Rates

On the basis that there has been no connection of the site to an existing drainage network, Consideration been given to the greenfield run off. The green field run off from the site has been assessed using Micro Drainage software for a catchment of 0.3 hectares. The green field run off has been assessed as 1.4 l/sec.

Run off from the development will be restricted to 5 l/sec as this is the practical limit that flow control devices can sensibly operate at.

3.3 Proposed Development

Details of the proposed development are set out in Section 2.5 and summarised below.

The proposed site areas have been assessed as follows:

Proposed Site Areas			
	m2	Hectares	Drainage Proposals
Dwellings	443	0.044	Connected to drainage system
Roads and Parking	1270	0.127	Lined permeable paving and drainage system
Garden and landscape	1356	0.136	No drainage
Total Areas		0.307	

3.4 Ground Investigations

A Phase I Geo-Environmental Desktop Report, was prepared by Sub Surface North West TRP Consulting in March 2024. See Appendix C.

An intrusive investigation has not been prepared. Based on experience of the area, it is anticipated that soak-aways may be ineffective.

3.4 Surface Water Drainage Options

Current guidance recommends that surface water run-off should be controlled as near as possible to its source. The Planning Practice Guidance suggests that the following hierarchy of drainage solutions should be considered:

- To the ground via infiltration
- To a surface water body
- To a surface water sewer
- To a combined sewer

These options are considered below.

Infiltration

Ground investigations have not been undertaken however it is expected that the site will be underlain by cohesive material with limited possibility for infiltration. This will be verified by an intrusive investigation.

Infiltration as a means of disposal for surface water from the site has therefore been discounted as part of this initial assessment.

The use of porous paving will be incorporated in the design, but this will be part of a lined storage system without infiltration to the underlying anticipated low permeability clay soils. The paving will however provide a degree of depression storage in intercepting the first few millimetres of rainfall.

Discharge to a surface water body

There is a watercourse along the eastern site boundary that is separated from the site by Wilmslow Road and third party land. Wilmslow Road is a major traffic route serving Manchester City centre. In addition, there is third party land that must be crossed to access this potential outfall.

The presence of a major highway link and the crossing of third party land make connection to this potential outfall unreasonable. This option has been rejected.

Discharge to a surface water sewer

There are no surface water sewer surrounding the site. This option for connection does not exist.

Discharge to a combined sewer

There are combined sewers to the south of the site below Moor Park Road and to the west of the site below Kingsway. There is a potential for connection to sewers in the A34 Kingsway through the strip of land that is owned by the developer.

Discharge to the adopted combined sewer network in the A34 Kingsway has therefore been selected as the point of discharge.

Preferred surface water disposal option

Discharge to the 600 diameter surface water sewer running below A34 Kingsway would be a feasible and acceptable solution.

3.6 Surface Water Drainage Design Criteria

The following criteria are to be adopted for design of the surface water drainage system.

- The SuDS techniques set out in the Ciria 753 (SuDS Manual) are to be reviewed in the context of the site conditions and constraints and implemented within the drainage design where feasible.
- The surface water discharge from the site is to be limited 5 l/sec
- The surface water drainage system will discharge to the 600 diameter surface water sewer running below Kingsway
- The surface water drainage network to be checked for a 1 in 2-year return period storm without surcharge
- The surface water drainage network to be checked for a 1 in 30-year return period storm with surcharging of pipes permitted
- The surface water drainage network to be checked for a 1 in 100-year return period storm with all runoff accommodated below ground without overland flow.
- A 40% increase in peak rainfall intensity to be included in the design to allow for climate change
- Simulations are to be undertaken for each drainage network using Micro Drainage Windes software to confirm the performance of the system under 1 in 2, 1 in 30 and 1 in 100-year storms for a range of storm durations.

3.7 SuDS Selection

SuDS are made up of one or more structures built to manage surface water run-off. They are used in conjunction with good management of the site, to prevent flooding and pollution. There are five general methods of control:

- Prevention
- Filter strips and swales
- Permeable surfaces and filter drains
- Infiltration devices
- Basins and ponds

The assessment of the site has identified some restrictions on the selection of suitable SuDS techniques:

- It is anticipated that ground investigations will indicate that there is negligible potential for infiltration. Infiltration as a means of disposal for surface water from the site has therefore been discounted.
- The development contains hard paving and driveways. The limited potential for infiltration precludes the effective use of permeable pavements for disposal of surface water. Use of permeable pavements will be limited to lined systems draining to the surface water drainage network but offering some attenuation and treatment of flows.

The review and selection of suitable SuDS techniques is summarized in the flowing table:

Suds Techniques		Adopted in Design	Reasons
Source Control	Green Roofs	No	traditional pitched roofs to be adopted for residential development, Green roofs were not considered to be appropriate
	Rainwater Harvesting	No	Not considered to be viable for the project
	Permeable pavements	Yes	Suitable but as part of a lined system without infiltration providing filtration.
Filtration Conveyance	Filter strips	No	Restricted site area.
	Swales	No	Restricted site area.
	Dry Swales	No	Restricted site area.
Infiltration	Infiltration Basin	No	
	Soakaways	No	

	Infiltration trench	No	Infiltration discounted on the basis ground conditions
	Permeable pavements	No	
Pre-treatment	Oil separator	No	Not required
Detention	Detention basin	No	No space on the site
	Below ground cellular storage	Yes	Will be required to attenuate flow

The SUDS features incorporated with the design are:

Source Control - Permeable pavements - These will be adopted for all main car parks and driveways where levels permit. This will be a lined system providing storage in the subbase, a limited degree of depression storage and some treatment.

Detention – Cellular tanks - below ground storage

3.7 Surface Water Drainage Design

The development site is to be considered as a greenfield for the purpose of assessing limits on post development surface water discharge.

The permissible discharge rate from the proposed development is to be limited to 5 l/sec. with final discharge to the existing combined sewer network.

Run off from roof areas will be collected by a network of below ground surface water drains. Run off from roads and drives will be collected through permeable paving and directed to the central cellular storage tank.

Attenuation will be provided in the form of the central cellular storage tank with final discharge to the adopted combined network controlled by a hydrobrake arrangement with flows matched to the minimum hydrobrake discharge rate of 5 l/sec.

Calculations for each drainage network and simulations for storms up to 1 in 100-year return period will be required.

The system will be checked for a range of storm durations and return periods up to a 1 in 100-year storm with allowance for a 40% increase in peak rainfall intensity to accommodate climate change. The calculations must confirm that all run off can be accommodated within the below ground network during the 1 in 100-year event without overland flow or surface storage.

4.0 MAINTENANCE

The final selection of SUDs features will form part of the detailed design of the residential design. Maintenance of the SUDs features will be undertaken by the owners via a management team unless systems associated with the residential development are to be offered for adoption.

The following lists the SUDs features which may be found on a site.

- **Filter strips** are grass verges that allow runoff to flow through vegetation to a swale, wetland, infiltration area or other SuDS technique.
- **Filter drains** clean, store and convey water to another feature or allow it to soak into the ground. They are stone filled trenches, sometimes with a perforated pipe in the bottom. These may be enlarged to treat dirty water, as treatment trenches, or increase soakage into the ground, as infiltration trenches.
- **Basins, ponds** are depressions in the ground where water is stored and treated. Water levels rise after rain and then drop to the normal level as the excess soaks into the ground or is released slowly to a watercourse or drain. Some water may be held back as a pond for final treatment, amenity or wildlife interest.
- **Inlets and outlets structures** are often conveyance pipes protected with mesh guards. They must be free from obstruction at all times to allow free flow through the SuDS.
- **SuDS flow control structures** are usually small orifices in control chamber, slots or V notches in weirs. They are usually near the surface so are accessible and easy to maintain. They may be in baskets, in small chambers or in the open.
- **Inspection Chambers** and rodding eyes are used on bends or where pipes come together. They allow cleaning of the system if necessary.
- **Overflows** can be below ground through gratings and chambers or over grass weirs in the open. They must be kept clear at all times to protect areas from flooding.

The process will be managed through the implementation of regular monthly inspection combined with regular maintenance, occasional maintenance, and remedial maintenance as appropriate.

The monthly inspections will be based on a specified checklist. Additional inspections will be undertaken after major rainfall events, to check for obstructions/damage and to remove debris and silt. Two checklists have been provided, one for the inspection of the surface water drainage systems generally and one for inspection of the detention ponds.

The checklist for regular inspections is set out below.

INSPECTION CHECKLIST – GENERAL	
Item	Action
Grass and vegetation	Mow amenity grass access paths and verges surrounding swales and filter strips at 35-50 mm minimum and 75 mm maximum or as specified. Mow rough grass areas for occasional access or habitat reasons at 100 mm and maximum 150 mm with cuttings removed to wildlife piles
Ponding or water logging during periods of heavy rainfall	Indicative of potential silting of the drainage system or ditches or obstructions within the below ground drawing system Occasional or Remedial maintenance may be required
Accumulation of silt in gullies and manholes trenches	Occasional or Remedial maintenance may be required. Remove silt as part of occasional maintenance
Accumulation of silt in ponds	Check silt depth and arrange for removal if depth exceed 300 mm. Timing of removal to minimise effects on planting and wildlife
Balding spots within grass cover or evidence of invasive species of weeds which might affect the infiltration trench.	Potential for damage or disturbance of infiltration structure and enclosing filter material Occasional or Remedial maintenance may be required.
Erosion or scour of the grass surface or slopes due to localised run off from paved areas	Potential for damage or disturbance of infiltration structure and enclosing filter material Occasional or Remedial maintenance may be required.
Settling, cracking, erosion or instability of pond side slopes and contributing areas.	Report damage/compromise to side slopes, pond banks. Repair eroded areas before next rainfall.
Check pond inlet and outlet pipes, flow control devices and outfalls.	Inspect surface structures removing obstructions and silt as necessary. Check there is no physical damage Strim vegetation 1m min. surround to structures and keep hard aprons free from silt and debris Remove cover and inspect ensuring water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt. Report any damage, prepare a repair schedule and complete repairs
Fuel spillage or evidence of contamination	Notify supervisor of any hazardous conditions or materials found during inspection.
Damage or displacement of manhole covers and gully gratings	Report any damage, repair or replace covers
Silting of ACO drainage channels	Occasional or Remedial maintenance may be required. Jet channels and remove silt from outlets as part of occasional maintenance
Check oil levels in bypass separators	Removal of hydrocarbon from interceptors

INSPECTION CHECKLIST - DETENTION POND			
Pond:	Date: _____	Inspected by: _____	
Type of Inspection:	☐ Routine	☐ Storm Event _____	(# days since event)
General Observations: :			
Is water flowing	☐ Yes	☐ No	
Standing water?	☐ Yes	☐ No	Depth: _____m Comments: _____
Any obstructions or erosion around the pond that could affect performance?			☐ Yes ☐ No
Pond Conditions:			
Does the pond sides/slopes/bottom show signs of settling, cracking, sloughing or other problems?			☐ Yes ☐ No
Do the embankments or side slopes show signs of any erosion or instability?			☐ Yes ☐ No
Is there any evidence of animal burrowing or activity that could contribute to instability or erosion?			☐ Yes ☐ No
Is there evidence of encroachment into the pond or improper use of the pond?			☐ Yes ☐ No
Do vegetated areas need mowing?	☐ Yes	☐ No	☐ Mowed today ☐ Schedule mowing
Are there areas that need to be re-vegetated?	☐ Yes	☐ No	Will schedule re-vegetation activities
Do vegetated areas need thinning, i.e. shrubs, trees?	☐ Yes	☐ No	☐ Thinned today ☐ Schedule thinning
Is there accumulation of debris/litter	☐ Yes	☐ No	☐ Removed ☐ Schedule removal
Any signs of vandalism or other activity that could affect performance of the pond?			☐ Yes ☐ No
Is there any visible pollution?	☐ Yes	☐ No	Erosion at high water mark? ☐ Yes ☐ No
Abnormally high-water level? (May indicate obstruction at orifice, or outlet structure not operating properly)	☐ Yes	☐ No	Unusual Algae blooms? (May signal too many nutrients in runoff; will need monitoring) ☐ Yes ☐ No
Structural Components:			
Are the pipes/inlets going into or out of the pond clogged or obstructed?			☐ Yes ☐ No
Is the outfall channel from the pond functioning appropriately?			☐ Yes ☐ No
Is the inflow trickle channel working properly?			☐ Yes ☐ No
Is the Hydrobrake silted obstructed?			☐ Yes ☐ No
Is the outfall channel, Hydrobrake or manhole in need of repair?			☐ Yes ☐ No
Are the manholes, frames, and covers in appropriate condition?			☐ Yes ☐ No
Do any safety features, such as fences, gates or locks need repair or replacement?			☐ Yes ☐ No
Plan of Action:			
If YES to any of the above, the following is an anticipated Maintenance Action List:			
Total number of concerns: _____			
_____	Need more monitoring	Frequency	_____
_____	Need routine repair		_____
_____	Need immediate repair		_____

Occasional maintenance will be carried out as and when required based on the findings of the monthly inspection or as needed after a storm event. Remedial maintenance operations may need to be considered in the region of 10-20 years from construction or earlier as dictated by the continuing ability of the drainage system to deal with surface water run-off.

Maintenance operations are summarised as follows

Regular Maintenance	Occasional Maintenance	Remedial Maintenance
Regular grass cutting – Frequency as required to maintain typical maximum length of 100 mm and minimum length of 25 mm	Periodic removal of surface silt from grassed areas and swales	Reinstatement of edgings to hard surfaces
Litter Removal from swales	Scarifying of grass to remove moss and thatch above lines of infiltration trenches	Reinstatement of levels and turf due to erosion
Clear inlets and outlets to manholes and cellular storage structures	Removal of potentially invasive weeds	Lifting turf and disposal of silt accumulation above infiltration trenches. Reinstatement of turf and rootzone.
Mechanical Equipment check: Inspection of any valves, pumps, fence gates, locks or mechanical components during periodic inspections and appropriate replacement/repair.	Repair and reinstatement of damaged grass	Replacement of geotextile and cleaning of stone infill to trenches. Possible including an increase in trench width of 50 mm each side to recover permeability of surrounding soil.
Structural Component check: Inspection of the outlet works, inlet and hydrobrake on a regular basis	Pump out silt pits and clear gullies	Repair and rehabilitation of inlets, outlets and overflows
	Sediment removal: Every six months or so, the accumulated sediment should be removed from the bottom of the outlet structure and the pond depths checked at several points. If the depth of the accumulated sediment is greater than 25% of the original design depth, sediment should be removed.	Re-level/ reinstate design levels
	Remove hydrocarbon residues from interceptors	Structural Repair/Replacement: Eventually the outlet structure or other structural components like the trickle channel or trash rack will need repair or be replaced.

5.0 CONCLUSIONS

The site is formed by a parcel of land that is almost triangular in plan located in Parrs Wood, Manchester and bounded by houses that front onto Kingsway, Wilmslow Road and Moor Park Road with The Gateway public house located immediately to the north of the site. There is a strip of land that connects the development to the A34 to the west of the site. The postcode of the site is M20 5PA, Parrs Wood, Manchester. The development area is around 0.3 Ha and comprises a greenfield previously undeveloped site.

The proposed development works involve the construction of four new detached homes with associated accessway and car parking.

The site is located in Flood Zone 2. Flood Zone 1 is land assessed as having a medium risk of flooding from rivers and the sea, less than 1 in 1,000 in any year.

An assessment of all potential sources of flooding on the site has been undertaken. The overall risk of flooding to the site has been assessed as low to medium.

The site is protected from flooding by flood defense systems that are in good to fair condition.

The development floor levels will be set above floor levels and safe access will be provided to and from the dwellings.

Resilient forms of construction will be used throughout.

Initial ground studies suggest that infiltration may be possible. However local knowledge suggests that soakaways are unlikely to be acceptable. Initial proposals, subject to ground investigation verification therefore assume that infiltration drainage systems would not provide a suitable means of surface water disposal from the site.

Having reviewed the hierarchy of drainage options available for disposal of surface water it is considered that connecting the development to the adjacent combined adopted sewer would be most solution.

The surface water drainage from the proposed development will discharge through a central underground storage tank. Flow from the tank will be attenuated with a hydro brake restricting the flow to 5 l/sec.

A review of SuDS techniques has been undertaken. Local attenuation of surface water flows will be achieved by use of permeable paving connected to the central underground tank.

Simulations will be undertaken to check the proposed surface water drainage system for a range of storm durations and return periods up to a 1 in 100-year storm with allowance for a 40% increase in peak rainfall intensity to account for climate change. The calculations confirm that all run off can be accommodated within the below ground network during the 1 in 100-year event without overland flow or surface storage.

It is considered that the proposed surface water drainage system will not increase the risk of flooding on the site or in the surrounding area.

APPENDIX A

A1 Consultation

From: [Enquiries, Unit](#)
To: [Geoff Wilks](#)
Subject: 240312/AG09 proposed development - 902 Wilmslow Road Didsbury
Date: 12 March 2024 11:10:55
Attachments: [image001.png](#)
[image002.jpg](#)
[image003.jpg](#)
[image004.jpg](#)

Hello Geoff,

Thank you for your email.

Our part in Flood Risk Assessments is to provide a set or sets of information that you can use as part of the process.

We refer to these sets of information as Products. If you look at the link below, you can work out which of these products you want, reply to this email and we will send your request to the local area team. You can choose between 8 products that we can produce for you.

<https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>

The local area team will then respond to your request within 20 working days.

If we can be of any more help, please contact us again.

Kind regards

Anna Goss
Customer Service Adviser

NCCC Contact Centre Services - Part of Operations, Regulation & Customer

Tel: 03708 506 506

This helpline is open 8am to 6pm during the week, closed Weekends or Bank Holidays

My working hours are normally 8am to 4pm, 8am to 11.30am on Thursday.

From: Geoff Wilks <g.wilks@trpconsult.com>
Sent: Monday, March 11, 2024 8:25 AM
To: Enquiries, Unit <enquiries@environment-agency.gov.uk>
Subject: 240312/AG09 proposed development - 902 Wilmslow Road Didsbury

You don't often get email from g.wilks@trpconsult.com. [Learn why this is important](#)

To whom it may concern

Proposed Development - 902 Wilmslow Road Didsbury

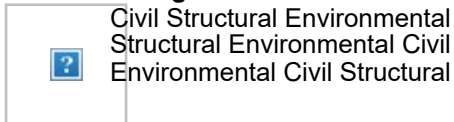
Could you please confirm if you any information that you feel would be valuable to a Flood Risk Assessment and Drainage Strategy for the site indicated on the enclosed plan. Please include details of historic flooding and any Specific Drainage requirements that may exists.

If there any requirements that you need addressing in these studies, please advise us so that these requirements can be included in our scope of investigation and reporting.

Please do not hesitate to contact me should you require further information or clarification.

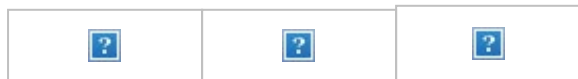
Regards
Geoff Wilks
Director

TRP Consulting



76 King Street
Manchester M2 4NH

T: 0161 839 9113
M: 0779 617 4474
W: www.trpconsult.com



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From: [Flood Risk Management](#)
To: [Geoff Wilks](#)
Subject: Automatic reply: proposed development - 902 Wilmslow Road Didsbury
Date: 08 May 2024 15:53:06

*Thank you for contacting Manchester City Council **Lead Local Flood Authority**.*

Your support enquiry has been received and a response will be provided within 21 days.*

*Pre-app advice is currently suspended, due to longer-than-normal response times on planning applications. We apologise for any inconvenience caused.

*Lead Local Flood Authority
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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From: [GMMC Info Requests](#)
To: [Geoff Wilks](#)
Subject: GMMC351326AB Response attached from the Environment Agency
Date: 19 March 2024 08:57:00
Attachments: [image001.png](#)
[image002.jpg](#)
[image003.jpg](#)
[image004.jpg](#)
[4606-101 A1 \(1\).pdf](#)
[4606-101 A1 \(1\).pdf](#)
[MR6W2NE1G4MM.pdf](#)

Dear Geoff,

Re: proposed development - 902 Wilmslow Road Didsbury

Thank you for your enquiry which was received on 11/3/24.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

I enclose the data requested.

Please be aware you can check your risk of flooding on our external website
<https://flood-warning-information.service.gov.uk/long-term-flood-risk/>

Here are some useful links below:

<https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities>

<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

For surface information please use link: <https://check-long-term-flood-risk.service.gov.uk/map?easting=362125.07&northing=388310.97&map=SurfaceWater>

Please refer to the [Open Government Licence](#) which explains the permitted use of this information.

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

Kind regards,

Anne Ball
Customer and Engagement Officer
Greater Manchester, Merseyside and Cheshire
Email: Inforequests.gmmc@environment-agency.gov.uk
Office address: Richard Fairclough House, Knutsford Road, Latchford, Warrington, WA14 4UW

From: Geoff Wilks <g.wilks@trpconsult.com>
Sent: Monday, March 11, 2024 8:20 AM
To: Enquiries, Unit <enquiries@environment-agency.gov.uk>
Subject: proposed development - 902 Wilmslow Road Didsbury

You don't often get email from g.wilks@trpconsult.com. [Learn why this is important](#)

To whom it may concern

Proposed Development - 902 Wilmslow Road Didsbury

Could you please confirm if you any information that you feel would be valuable to a Flood Risk Assessment and Drainage Strategy for the site indicated on the enclosed plan. Please include details of historic flooding and any Specific Drainage requirements that may exists.

If there any requirements that you need addressing in these studies, please advise us so that these requirements can be included in our scope of investigation and reporting.

Please do not hesitate to contact me should you require further information or clarification.

Regards

Geoff Wilks

Director

TRP Consulting



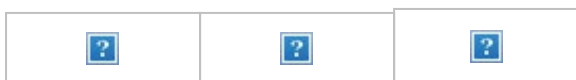
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Environmental Civil Structural

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From: seweradoptions@uuplc.co.uk
To: [Geoff Wilks](#)
Subject: UU REF 05433188- General Enquiry – Wilmslow Road, Didsbury
Date: 11 March 2024 16:29:45
Attachments: [image001.png](#)
[image002.jpg](#)
[image003.jpg](#)
[image004.jpg](#)

Good Afternoon Geoff,

Thank you for your email, please see below:

UU REF 05433188- General Enquiry – Wilmslow Road, Didsbury

I can confirm there are no records that would benefit your report, however I would take this opportunity to state that any new drainage proposals must follow the drainage hierarchy and any proposed surface water flows to the combined system must only be considered as a last resort.

Regards

Anthony

Anthony Laithwaite

Ww Engineer
Developer Services & Metering
Customer Services

M: 07880 298897
unitedutilities.com

----- Original Message -----

From: seweradoptions@uuplc.co.uk [seweradoptions@uuplc.co.uk]
Sent: 11/03/2024 15:47
To: g.wilks@trpconsult.com
Subject: RE: FW: proposed development - 902 Wilmslow Road Didsbury

Good Afternoon,

Thank you for your email this has been logged to the engineer Anthony, their number is 07880298897. They have a service level agreement to respond on or before 25/03/2024.

Kind Regards,

Katie Houghton

Customer Advisor Advanced
Developer Services & Metering
Customer Services

Tel: 0345 072 6067 (option 4)
unitedutilities.com



Customer Advisor Advanced
Developer Services & Metering
Customer Services

Tel: 0345 072 6067 (option 4)
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----- Original Message -----

From: Geoff Wilks [g.wilks@trpconsult.com]

Sent: 11/03/2024 08:23

To: wastewaterdeveloperservices@uuplc.co.uk

Subject: FW: proposed development - 902 Wilmslow Road Didsbury

To whom it may concern

Proposed Development - 902 Wilmslow Road Didsbury

Could you please confirm if you any information that you feel would be valuable to a Flood Risk Assessment and Drainage Strategy for the site indicated on the enclosed plan. Please include details of historic flooding and any Specific Drainage requirements that may exists.

If there any requirements that you need addressing in these studies, please advise us so that these requirements can be included in our scope of investigation and reporting.

Please do not hesitate to contact me should you require further information or clarification.

Regards

Geoff Wilks

Director

TRP Consulting



Civil Structural Environmental

Structural Environmental Civil

Environmental Civil Structural

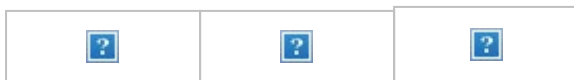
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APPENDIX B

B1 Environment Agency Information