

Land at Cob Kiln Lane, Urmston

**Flood Risk Assessment
& Outline Drainage Plan**

For

EBR Designs

Project Number:

13565

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1.0 EXECUTIVE SUMMARY

- 1.1.1. EBR Designs are proposing to redevelop an existing livery yard together with associated stables, riding areas, paddock shipping containers and storage buildings. CampbellReith was commissioned to produce a flood risk assessment and outline drainage plan to support a forthcoming Full Planning Application for the development of the Site.
- 1.1.2. The proposed development is understood to comprise of the demolition of the existing livery yard and erection of a single storey Children's Nursey together with associated parking and landscaping. The remainder of the site boundary will be landscaped.
- 1.1.3. Environment Agency (EA) flood maps indicate that the majority of the Site lies within Flood Zone 2, with a small area of the Site indicated to be within Flood Zone 3, although the extents of the Site located within Flood Zone 3 is only proposed to be utilised as car parking within the proposed development.
- 1.1.4. In January 2021, Storm Cristoph brought intense rainfall over northern England which caused flooding at the site. The post flood inspections carried out by The Environment Agency confirmed that a section of high ground separating Old Eea Brook and the River Mersey had suffered from a notable amount of erosion and that the River Mersey overtopped its banks and entered Old Eea Brook at this location. The monitoring station at Ashton Weir on the River Mersey rose to 18.76m AOD, equivalent to the modelled 1 in 1000 year flood level provided the Environment Agency. It is therefore assumed that Storm Christoph was an extreme rainfall event with an annual probability of 0.1%.
- 1.1.5. The Environment Agency will continue to monitor the extent of erosion between the River Mersey and Old Eea Brook and "*should the erosion worsen, our inspectors would record this failure to the asset performance team who will action as is required*". Furthermore there is an ongoing discussion with Trafford Council, the alleged land owner of the eroded area, to resolve the issue. Once the eroded area has been rectified the flood risk in the area will be reduced.
- 1.1.6. In line with the Department of Environment, Food and Rural Affairs and the EA's standing advice for vulnerable developments, the finished floor level of the Nursery should be set a minimum of 300mm above the general ground level, i.e. 18.30m Above Ordinance Datum (AOD), which is above the 1 in 100 year plus 70% climate change event. For additional protection and future proofing of the Site, flood resilience / resistance measures, such as raising electrical sockets and storing valuable items above the 1 in 1000 event of 18.47m AOD, could be implemented.
- 1.1.7. The Site is located within an area identified to be susceptible to groundwater flooding. However, there are no known records of groundwater flooding within the Site or the surrounding area. An increase in impermeable area following development of the Site will reduce the risk of groundwater emergence, therefore groundwater flood risk to the Site is considered to be low.
- 1.1.8. EA flood maps indicate some areas of the areas of the Site to be at very low risk of surface water (pluvial) flooding and some areas to be at high risk. The areas of the Site indicated to be at high risk of pluvial flooding are associated with a topographic low point in the southwest Site corner, Old Eea Brook and an unnamed land drain both adjacent to the Site boundary. The areas at high risk of pluvial flooding within the Site are to not be developed as part of this proposals, and the proposed nursery is to be constructed in an area at very low risk of pluvial flooding. Any additional pluvial flood risk as a result of developing the Site should be mitigated through the implementation

of a suitable surface water drainage strategy. The risk of pluvial flooding impacting the proposed development is considered to be low.

- 1.1.9. There are no public or private drainage infrastructure identified to be located within the Site boundary. A 225mm combined water public sewer is located approximately 85m to the north of the Site. If the combined water sewer to the north were to flood, the existing ground levels would result in the flows draining towards the Site and into Old Eea Brook, at the north Site boundary. The surrounding public sewerage infrastructure is maintained by United Utilities. Therefore, the risk of sewerage infrastructure flooding the Site is considered to be low.
- 1.1.10. The Site is located within an area at risk of flooding as a result of reservoir failure. Reservoirs undergo regular and rigorous maintenance regimes by the local sewerage undertaker and/or the Lead Local Flood Authority and therefore the risk of reservoir failure impacting the Site is considered to be low.
- 1.1.11. Old Eea Brook is culverted at the point that the north Site access road crosses the watercourse. If the culvert were to become blocked and/or collapse the Site would be at risk of flooding from the impeded flows from Old Eea Brook. From a Site inspection, the culvert is sufficiently wide enough that it is unlikely to be blocked and appeared structurally sound at the time of the inspection, although no formal inspection of the culvert has taken place to assess its functionality or condition. The risk associated with a failure of the culvert is considered to be low, providing that the culvert is maintained structurally and hydraulically by the riparian land owner during the life of the development.
- 1.1.12. A post-development outline surface water drainage strategy has been proposed within this report. The drainage proposal utilises permeable paving with a minimum 200mm lined subbase installed within the proposed car parking and outdoor play area to attenuate up to 110.4m³ of surface water during the critical 1 in 100 year plus 40% climate change rainfall event. Surface water runoff is then proposed to be discharged into Old Eea Brook at a restricted rate of 5.0l/s via an orifice plate, as agreed with the Lead Local Flood Authority.
- 1.1.13. The nearest public foul water accepting sewer is located approximately 85m to the north of the Site, within Meadow Road. United Utilities have confirmed that the Site can discharge into this sewer at an unrestricted rate. However, a review of the sewer's invert level indicates that a gravity connection is not achievable. Therefore, foul water flows from the development will need to either be pumped to the sewer or treated on site in a Package Treatment Plant.
- 1.1.14. In accordance with the National Planning Policy Framework, the proposed nurseys being classed as 'more vulnerable' located within Flood Zone 2 and a small area of the car parking located within Flood Zone 3, the proposed development is considered appropriate for development, providing that the mitigation measures outlined within this report are adhered to.

2.0 INTRODUCTION

2.1. Scope of Works

- 2.1.1. CampbellReith was appointed by EBR Designs, on behalf of their Client, to prepare a site-specific Flood Risk Assessment (FRA) to assess the risk of flooding both to and from the site in support of a forthcoming full Planning Application.
- 2.1.2. The proposed development is located at the land off Cob Kiln Lane, Urmston in Greater Manchester. The Site proposed for development is approximately 1.0 hectares (ha) in area and is an equestrian livery yard together with the associated stables, riding arenas, paddock, shipping containers and storage buildings.
- 2.1.3. This report assesses the potential sources of flooding including fluvial, pluvial, groundwater, overland flows, artificial drainage system and infrastructure failure to ensure the proposed development is safe and sustainable from a Flood Risk perspective.
- 2.1.4. This report will also propose an outline drainage plan for the disposal of surface and foul water flows from the proposed development.

2.2. Sources of Information

- 2.2.1. Elements of this assessment are based on information supplied or provided by others from the following sources:

Table 2-1: Sources of Information

Source of Information	Author / Originator	Date
Manchester, Salford and Trafford Councils Level 1 Strategic Flood Risk Assessment (SFRA)	JBA Consulting	March 2010
Manchester, Salford and Trafford Councils Level 2 Strategic Flood Risk Assessment	JBA Consulting	March 2011
Trafford Council Local Flood Risk Management Strategy (LFRMS)	Trafford Council	September 2014
Trafford Local Plan: Core Strategy	Trafford Council	January 2012
United Utilities Sewer Records	United Utilities	November 2019
Trafford Council Supplementary Planning Document (SPD) 1: Planning Obligations, Technical Note (TN) 3: Climate Change – Mitigation and Adaption	Trafford Council	February 2012
Flood Risk Assessment 1.0	UK Flood Risk	December 2017

- 2.2.2. CampbellReith has endeavoured to assess all information provided during this assessment, although it should be noted that this report summarises information from a number of external sources and CampbellReith cannot offer any formal guarantees or warranties as to the completeness or accuracy of information relied upon.

- 2.2.3. The proposed development of the Site includes the demolition of the existing livery yard and erection of a single storey Children's Nursery together with associated parking and landscaping.
- 2.2.4. A Site Location plan (Drawing no. ebr/00546/A0.1) and proposed site plan (Drawing no. ebr/00609/A0.14) provided by the Client are presented within Appendix 1.

2.3. **Limitations**

- 2.3.1. This Report has been prepared for exclusive use by EBR Designs for the purpose of assisting them in evaluating the potential risk of flooding associated with the site.
- 2.3.2. CampbellReith accepts no liability for any use of this document other than by its Client and only for the purposes stated in the document, for which it was prepared and provided. No person other than the Client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of Campbell Reith Hill LLP. Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of the document as a whole.
- 2.3.3. This Flood Risk Assessment addresses the flood risk posed to and from the proposed development, the extent and type of which is shown on the indicative concept plans enclosed herein. This Assessment has been undertaken on the assumption that the site will be developed in accordance with these proposals without significant change. The conclusions resulting from this Assessment may not necessarily be indicative of future conditions or operating practices at or adjacent to the site.

3.0 PLANNING FRAMEWORK AND FLOOD RISK POLICY

3.1. National Planning Policy Framework

- 3.1.1. The National Planning Policy Framework (NPPF) sets out the Government's national policies on land-use planning in England and how land-use Planning should be applied in relation to flood risk.
- 3.1.2. The NPPF requires a site specific flood risk assessment for proposals of "1 hectare or greater in Flood Zone 1; all proposals for new development (including minor development and change of use) in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency); and where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding"¹.
- 3.1.3. Information regarding a site's vulnerability to flood risk has been defined in accordance with Table 2 'Flood Risk Vulnerability Classification'². Similarly, the development's suitability to be located within a flood zone has been assessed in accordance with Table 3 'Flood Risk Vulnerability and Flood Zone Compatibility'³.

3.2. Local Planning Policy

Manchester, Salford and Trafford Council's Level 1 & Level 2 Strategic Flood Risk Assessments

- 3.2.1. The Manchester City, Salford City and Trafford Councils Level 1 and 2 SFRA⁴ were completed in March 2010 and 2011, respectively. The information produced as part of the SFRAs indicate the Site to be at risk from fluvial, pluvial, groundwater flooding and flooding from infrastructure failure.
- 3.2.2. Figure SS_4.5⁵, produced for the Level 2 SFRA indicates that the Site lies within the Manchester and Trafford South 'Critical Drainage Area' (CDA). CDAs are identified from historical flood events and/or modelled data as having a significant risk from surface water flooding, and include drainage catchments for surrounding sewer networks.
- 3.2.3. These sources of flooding will be assessed further in Section 4.

Trafford Council – Local Flood Risk Management Strategy

- 3.2.4. Trafford Council's LFRMS⁶ was completed in September 2014. The LFRMS provides an assessment of local flood risk within the Trafford Borough and identifies the Council's objectives for managing local flood risk. This document has been reviewed and taken into consideration for this FRA.

¹ National Planning Policy Framework, DCLG, 2018 – Footnote 50.

² National Planning Policy Framework, DCLG, 2018 Paragraph: 066 Reference ID: 7-066-20140306

³ National Planning Policy Framework, DCLG, 2018 Paragraph: 067 Reference ID: 7-067-20140306

⁴ Manchester, Salford and Trafford Level 1 (2010) and 2 (2011) SFRA. Available from: <https://www.trafford.gov.uk/planning/strategic-planning/strategic-flood-risk-assessment.aspx>

⁵ Manchester, Salford and Trafford Level 2 SFRA Critical Drainage Areas Map 'SS_4.5' (2011). Available from: https://www.manchester.gov.uk/downloads/download/6981/strategic_flood_risk_assessment_sfra_maps

⁶ Trafford Council Local Flood Risk Management Strategy (2014). Available from: <https://www.trafford.gov.uk/planning/strategic-planning/local-flood-risk-management-strategy.aspx>

Trafford Council – Local Plan: Core Strategy

- 3.2.5. Trafford Council's Local Plan Core Strategy⁷ was adopted in January 2012 and sets out the Council's policies on development for the borough up to 2026. Of particular relevance to the Site are Policies L5.17 and L5.18, of Policy L5: Climate Change (Water). The policies relevant for the Site are outlined as follows, although it should be noted that they are supplemented and in some cases superseded by similar policies within the more recent NPPF (February 2019):

Policy L5.17: - *"Developers will be required to demonstrate, where necessary by an appropriate FRA at the planning application stage that account has been taken of flood risk from all sources as identified in the Council's SFRA and/or shown on the Key Diagram, and that the proposed development incorporates flood mitigation and management measures where appropriate to the use and location."*

Policy L5.18 – *"Developers will be required to improve water efficiency and reduce surface water run-off through the use of appropriate measures such as rain water harvesting, water recycling and other Sustainable Drainage Systems (SuDS) appropriate to the various parts of the Borough, as mapped in the Council's SFRA. Further guidance will be set out in the supporting Technical Note and SPD."*

Trafford Council – SPD 1: TN 3: Climate Change – Mitigation and Adaption

- 3.2.6. Trafford Council's Technical Note on Climate Change⁸ was issued in February 2012. Guidance provided within the Technical Note relevant for the Site is in regards to the requirements for surface water discharge for Sites that are located within a CDA. The amount of weight to be given to this SPD is a matter for determination by the Council's planning department and is included for the sake of completeness.

- 3.2.7. The recommended guidance is outlined below:

- *"Development should aim to deliver Greenfield runoff on Greenfield sites up to a 1 in 100 year storm event, considering climate change;*
- *Development should aim for a minimum reduction in surface water runoff rates of 50% for Brownfield sites. With an aim of reducing runoff to Greenfield rates up to a 1 in 100 year storm event, considering climate change;*
- *Development should be designed so that there is no flooding to the development in a 1 in 30 year event so that there is no property flooding in a 1 in 100 year plus climate change event."*

⁷ Trafford Council Local Plan: Core Strategy (Adopted January 2012). Available from: <https://www.trafford.gov.uk/planning/strategic-planning/Development-Plan/local-plan.aspx>

⁸ Trafford Council Supplementary Planning Document 1L Planning Obligations, Technical Note 3: Climate Change – Mitigation and Adaption (2012). Available from: <https://www.trafford.gov.uk/planning/strategic-planning/docs/spd1-planning-obligations-tn-3.pdf>

4.0 SITE CONTEXT

4.1. Site Location

- 4.1.1. The Site is located at the Land at Cob Kiln Lane, Urmston, Trafford, M41 9LB at National Grid Reference X: 376990 Y: 394192, which is approximately 8km southwest of Manchester City Centre.

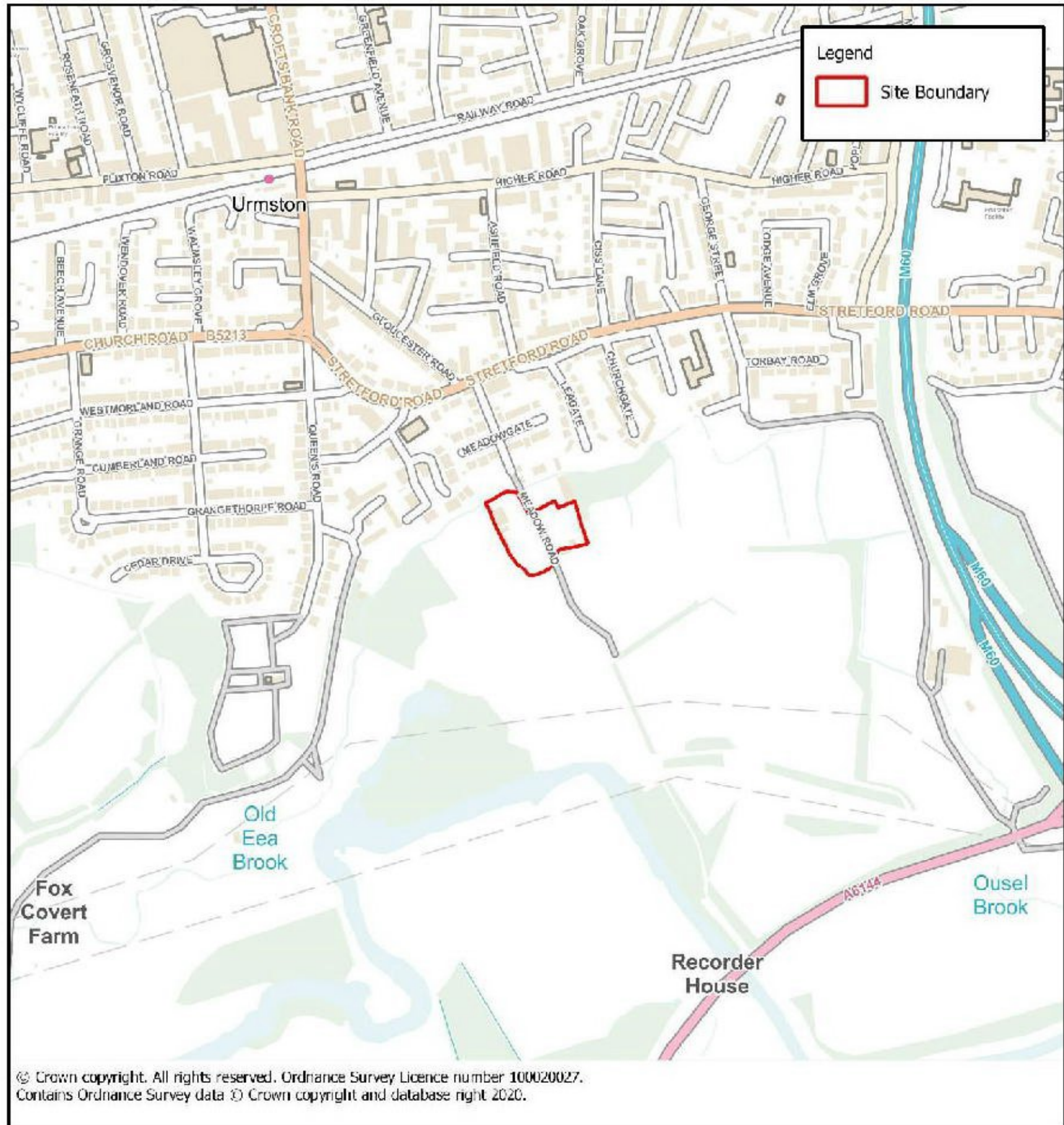


Figure 4.1: Site Location Plan (Not to scale)

4.2. Site Characterisation

- 4.2.1. The Site extends to approximately 1.0 ha in area. It is an equestrian livery yard together with the associated stables, riding arenas, paddock, shipping containers and storage buildings.
- 4.2.2. The Site is bounded to the north by Old Eea Brook, a retail unit for the sale of horse tack and supplies and residential developments. The Site is bounded to the east, west and south by open land, some of which is used for grazing and includes a disused playing field and pavilion/changing rooms.

- 4.2.3. The primary vehicular access point to the Site is from the north, via Meadow Road.
- 4.2.4. Old Eea Brook flows under the access road, Cob Kiln Lane. A field ditch is located adjacent to the Site's west boundary, flowing into Old Eea Brook. Following a Site inspection undertaken on 27th November 2019, the ditch is considered to be a land drain that was constructed for drainage purposes.
- 4.2.5. Old Eea Brook was identified to be culverted at the northern Site access road. The upstream end of the culvert is a large pipe, approximately 1.2m in diameter, the downstream end of the culvert is a box culvert, approximately 2m in width.
- 4.2.6. The land drain appears to have been split into two separate ditches by an access track between the horse stables and neighbouring field to the west. The north half of the ditch drains into Old Eea Brook and the southern half of the ditch only appeared to retain standing water.
- 4.2.7. The River Mersey is located approximately 280m to the south of the Site.
- 4.3. **Topography**
 - 4.3.1. A topographic survey of the Site was undertaken in March 2019 and is attached as Appendix 2. Levels on the topographical survey relate to the Ordnance Survey (OS) Datum.
 - 4.3.2. The majority of the Site is relatively flat, with the levels ranging from approximately 17.45m Above Ordnance Datum (AOD) to 18.23m AOD.
 - 4.3.3. On the day that the topographic survey was conducted, the water level of Old Eea Brook was recorded to be approximately 16.90m AOD.

4.4. Existing Ground Conditions

- 4.4.1. British Geological Survey (BGS) Geology of Britain map⁹ indicates that the Site is likely to be underlain by Alluvium (a mixture of clay, silt, sand and gravel) over Wilmslow Sandstone Formation. In addition, Cranfield University's Soils Map¹⁰ indicates the ground conditions at Site to be *"loamy and clayey floodplain soils with naturally high groundwater"*.
- 4.4.2. Based on the above information, it is considered unlikely that the ground conditions on-site are favourable for the use of infiltration SuDs, primarily based on the loamy and clayey topsoil within an area of naturally high groundwater. Furthermore, during the Site walkover, a significant portion of the Site was observed to be saturated and covered by standing water, suggesting that the ground within the Site has a low permeability and/or presence of a high groundwater table.
- 4.4.3. Despite the use of infiltration SuDs not looking favourable, it is recommended that on-site infiltration testing is conducted in accordance with the BRE 365 methodology for soakaway testing, so as to confirm the suitability of the use of infiltration SuDs within the proposed development. Infiltration testing is recommended to be conducted prior to detailed design.

4.5. Existing Drainage Infrastructure

- 4.5.1. The sewer infrastructure network in the vicinity of the Site is owned and operated by United Utilities (UU) and a copy of their Sewer Plans have been presented within Appendix 3.
- 4.5.2. No public sewerage infrastructure is shown to be present within the Site area.
- 4.5.3. To the north of the Site, a 375mm diameter surface water pipe, within the western side of Cob Kiln Lane, conveys flows to the south towards an outfall discharging into Old Eea Brook, from its northern bank.
- 4.5.4. A 225mm diameter combined water sewer is present within Meadow Road, located approximately 85m to the north of the Site, conveying flows away from the Site, to the north.
- 4.5.5. A Site inspection and topographic survey did not identify any private drainage infrastructure to be present within the Site. Rainwater pipes from existing buildings were identified to drain directly to the ground or runoff into the surrounding watercourses.
- 4.5.6. Any foul water flows generated within the existing development may be discharged into a septic tank, although it is unclear that any foul water flows are generated within the existing Site area.

⁹ British Geological Survey Geology of Britain Map. Available from: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

¹⁰ Cranfield University's Soils Map. Available from: <http://www.landis.org.uk/soilsmap/>

5.0 FLOOD RISK ASSESSMENT

5.1. Potential Flood Hazards

- 5.1.1. There are a variety of flood mechanisms that can affect the risk of flooding to a site, most of which are largely dependent on the site's characteristics and location. Based on a review of available documentation, the flood mechanisms that are considered to potentially affect the site are highlighted in Table 5-1.

Table 5-1: Categories of Flood Mechanisms (From Box 2.3 CIRIA C624)

Category	Flood Mechanism	Potential to affect site Y/N?
Fluvial Flooding	Exceedance of the flow capacity of the channel of a river, stream or other natural watercourse, typically associated with heavy rainfall events. Excess water spills onto the flood plain	Y – Old Eea Brook and the unnamed ditch are located adjacent to the Site.
Coastal & Tidal Flooding	High tides, storm surges and wave action, often in combination	N – Not in close proximity to any coast or tidal feature.
Estuarial flooding and watercourses affected by tide locking	Often involving high tidal levels and high fluvial flows in combination	N – Not in close proximity to any estuary.
Groundwater Flooding	Raised groundwater levels, typically following prolonged rain (may be slow to recede). High groundwater levels may result in increased overland flow flooding	Y – Located in an area indicated to be susceptible to groundwater flooding.
Flooding from overland flow	Water flowing over the ground surface that has not reached a natural or artificial drainage channel. This can occur when intense rainfall exceeds the infiltration capacity of the ground, or when the ground is so highly saturated that it cannot accept any more water.	Y – Surface water flood maps show that the southwest corner and Site access road are at risk of surface water flooding.
Flooding from artificial drainage systems	Blockage or overloading of pipes, sewers, canals, and drainage channels or failure of pumping systems. Typically following heavy rain or as a result of high water levels in a receiving watercourse	Y - Public sewerage network located approximately 85m to the north of the Site, although ground levels fall towards to the Site from the existing sewerage network.
Flooding from infrastructure failure	Structural, hydraulic or geotechnical failure of infrastructure that retains, transmits or controls the flow of water	Y – Reservoir flood risk map shows that the Site is located within an area at risk of flooding from reservoir failure.

5.2. Fluvial Flooding

- 5.2.1. The Environment Agency's (EA) flood map for planning identified the majority of the Site to lie within Flood Zone 2. A small area to the north of the Site is shown to be within Flood Zone 3, associated with flooding from Old Eea Brook. The area of the Site within Flood Zone 3 is proposed to be utilised as a car parking space within the proposed development.

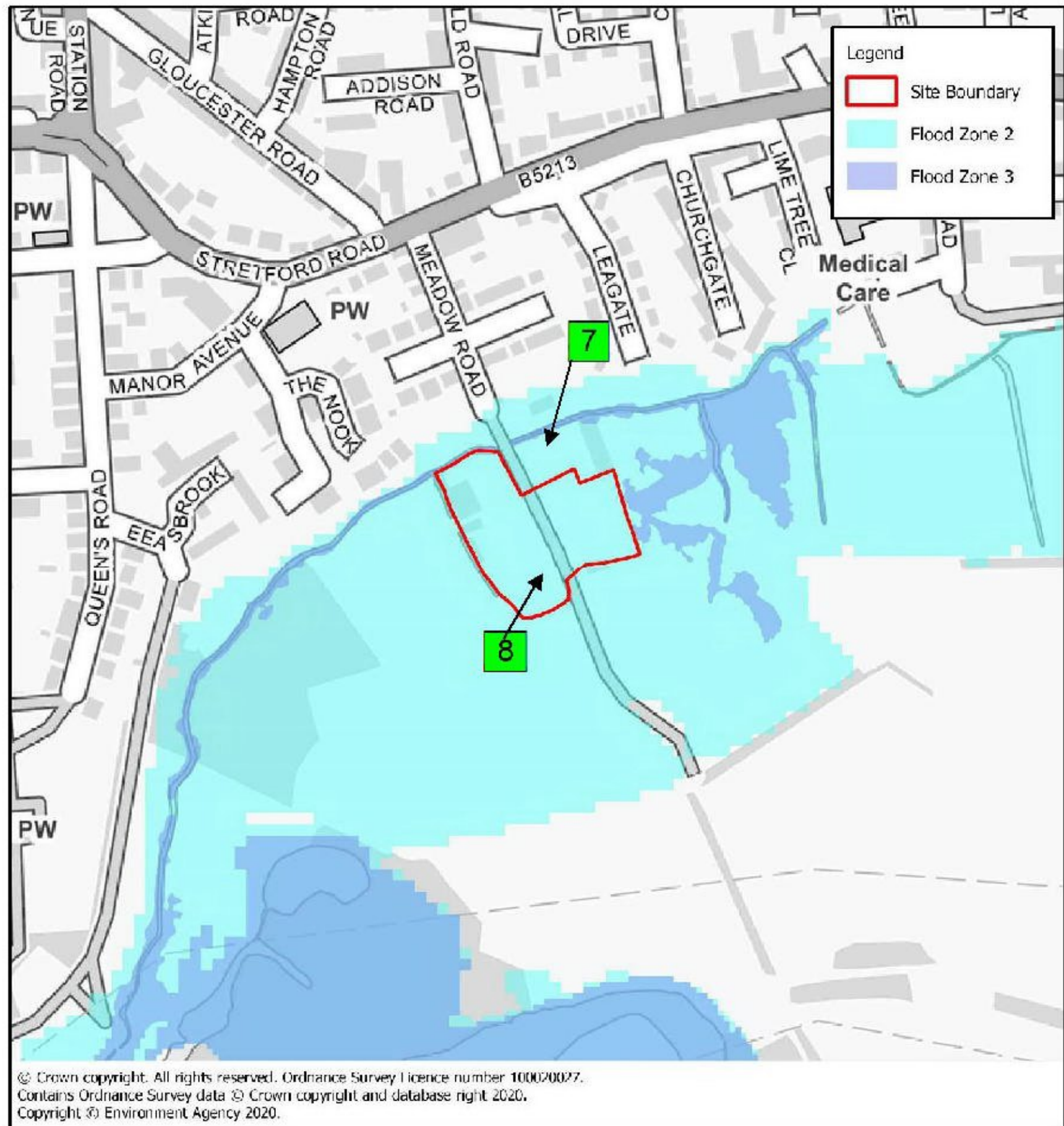


Figure 5.1: Current EA Flood Zone Map (not to scale)

- 5.2.2. Flood model data obtained from the EA's Upper Mersey 2017 Study shows two nodes located within the Site. The EA model flood data has been tabulated overleaf.
- 5.2.3. Consultation with the EA states that the Site is not impacted by the 1 in 100 year event and is therefore not located within Flood Zone 3.
- 5.2.4. A comparison of the EA model data and existing ground levels, indicates that the Site is likely to be flooded during the 1 in 1000 year event and is therefore considered to lie within Flood Zone 2, defined as having a medium risk of flooding. All correspondence with the EA and flood model data has been provided within Appendix 4.

Table 5-2: Defended Water Levels (Model data taken from EA Upper Mersey 2017 Study)

Map Reference	Model Node Ref	Node Location (National Grid Reference)	Maximum Water Levels (mAOD)		
			1 in 100 year (+70% CC)	1 in 1000 year	1 in 1000 year (+30%)
7	2D Levels	X: 376994 Y: 394245	18.21	18.47	18.87
8		X: 376985 Y: 394157	18.23	18.47	18.87

- 5.2.5. In January 2021 the site was flooded during the Storm Christoph event. Correspondence from the Environment Agency confirmed a narrow section of high ground (approximate NGR SJ7671393796, approximately 0.5km from site) located between the River Mersey and Old Eea Brook had *"suffered from a notable amount of erosion"* causing the River Mersey to overtop its bank into Old Eea Brook. Subsequently, flows within Old Eea Brook were impeded resulting in flooding upstream within the site and surrounding areas.
- 5.2.6. The Environment Agency do not currently have any flood level extent data covering the area surrounding the site. However, data from the Environment Agency's monitoring gauge Ashton Weir (ref. 5008) located on the River Mersey approximately 565m south of the site recorded a level of 3.91m above the site datum of 14.85m AOD on the 21st January 2021, indicating a river level of 18.76m AOD.
- 5.2.7. In comparison to the flood level data provided by the Environment Agency for the River Mersey, a level of 18.76mAOD corresponds to the modelled 1 in 1000 year event at the same location referred to as node ea013_0243_MERS01_9385 (Map ref 1). As such, it is assumed that Storm Christoph was an extreme rainfall event with an annual probability of 0.1%. It is therefore anticipated that flood levels at the site would be up to 18.47m AOD in accordance with the modelled 1 in 1000 flood level data tabulated in Table 5-2 above.
- 5.2.8. Correspondence from the Environment Agency confirmed that they would continue *"monitoring the rate of erosion along the banks of the River Mersey at this location with an inspection frequency of every 6 months and should the erosion worsen, our inspectors would record this failure to the asset performance team who will action as is required"*. Local Landowners are also in discussion with Trafford Council, who are the alleged land owner of the eroded area, to rectify the issue. Once the embankment has been repaired the risk of flooding in the area will be reduced.
- 5.2.9. In accordance with the EA's FRA: climate change allowances guidance¹¹ the higher central and upper central climate change allowance for a more vulnerable development should be assessed to determine the likely impact of flooding in the future. The EA have provided flood model data for the 1 in 100 + 70% Climate Change event which is the 'upper end peak river flow allowance'.
- 5.2.10. To mitigate against the impact from fluvial flooding within the Site. It is recommended that Finished Floor Levels (FFLs) are set in line with the Department of Environment, Food and Rural Affairs (DEFRA) and the EA's standing advice for vulnerable developments¹². The standing advice states that *"Ground floor levels should be a minimum of whichever is high of:*

¹¹ Environment Agency's Flood Risk Assessments: Climate Change Allowances, Guidance – Available from: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#table-1>

¹² Preparing a Flood Risk Assessment: Standing Advice, Environment Agency and DEFRA (2019). Available from: <https://www.gov.uk/guidance/flood-risk-assessment-standing-advice>

- *300mm above the general ground level of the Site, or*
 - *600mm above the estimate river or sea flood level'*
- 5.2.11. As the Site is not indicated to be impacted by flooding during the 1 in 100 year river flood event, it is recommended that the finished floor level of the Nursey is set to a minimum of 300mm above the existing ground level within the proposed building footprint. Therefore, it is recommended that the finished floor level of the Nursey is set to a minimum of 18.30m AOD, which is above the 1 in 100 year plus 70% climate change event.
- 5.2.12. For additional protection, flood resilience / resistant measures, such as installing flood bricks and raising electrical sockets above the 1 in 1000 level of 18.47m AOD, could be implemented.
- 5.2.13. During the Site inspection a ditch was identified along the western Site boundary. Historical maps do not show the presence of a watercourse in this location therefore the ditch is considered to be a land drain that was constructed for drainage purposes, discharging into Old Eea Brook.
- 5.2.14. During extreme rainfall events, such as the 1 in 1000 year event, water in the drain could back up as a result of rising water levels in Old Eea Brook. During extreme flooding events there is a risk that the water levels in the land drain will rise high enough for the drain to overtop and flow towards the topographic low point at the southwest Site corner and/or into the open field adjacent to the west Site boundary.
- 5.2.15. During the Site inspection, the land drain was observed to be heavily vegetated and also split into two halves, to provide access to the adjacent field, with the northern side flowing into Old Eea Brook and the southern side holding standing water.
- 5.2.16. It is recommended that during the development of the Site, the land drain's banks are cleared of vegetation or obstructions to increase the capacity of the drain. A culvert could also be constructed under the field access to allow for an increase in storage potential during extreme rainfall events.
- 5.2.17. To reduce the risk of fluvial flooding from Old Eea Brook and land drain at the west Site boundary during the lifespan of the development, it is the responsibility of the riparian landowners to maintain the Brook and land drain to ensure that flows are not impeded from overly dense vegetation growing along their respective banks.
- 5.2.18. It is considered that currently, the Site is at medium risk from fluvial flooding. However, if the mitigation measures provided above are adhered to the risk of fluvial flooding is considered to be low.

5.3. **Groundwater Flooding**

- 5.3.1. Manchester, Salford and Trafford Councils Level 2 SFRA identifies that the Site resides within an area at risk to groundwater flooding, although the Level 1 SFRA states that there are no known records of groundwater flooding in the Trafford Borough.
- 5.3.2. There are no publically available borehole logs from the BGS¹³ within 100m of the Site. However, the closest publically available borehole log, located on the southern side of Old Eea Brook, approximately 150m to the east of the Site, did not record any ground water from a 2.6m deep borehole conducted at a ground level of 17.55m AOD. The closest available borehole log on the northern side of Old Eea Brook, approximately 135m to the west of the Site, encountered ground water at 2.9m below the ground level of 19.83m AOD.
- 5.3.3. The risk of groundwater emergence within the Site will be reduced following development with an increased area of impermeable paving associated with the construction of the nursery buildings and car parking, acting as a barrier to the emergence of groundwater at these locations.
- 5.3.4. On this basis, the risk of groundwater flooding is considered to be low. However, it is recommended that any basement structures should be avoided.
- 5.3.5. The level 2 SFRA also indicates the Site to be within a region of naturally shallow groundwater. Shallow groundwater levels can exacerbate the impact of other sources of flooding, such as pluvial flooding, increasing the likelihood of overland flow or standing water expected to occur in the naturally low lying areas within the Site, which is located at the southwest Site corner, outside of the footprint of the proposed nursery and car parking.
- 5.3.6. A copy of the Groundwater Flood Map has been presented within Appendix 4.

5.4. **Pluvial Flooding**

- 5.4.1. The EA's long term pluvial flood risk map shows that the majority of the Site is at very low risk of surface water flooding. The southwest corner of the Site is shown to be at low to high risk of pluvial flooding, although this area of the Site is to remain as an undeveloped 'outdoor rising area' for horses post development. A small area at the very north of the Site is indicated to be at high risk of pluvial flooding associated with Old Eea Brook. Based on the existing topography it is considered that the overland flows will naturally drain away from the Site into Old Eea Brook.
- 5.4.2. It is considered that the pluvial flood risk for the Site is generally associated with Old Eea Brook and the unnamed drainage ditch, both bordering the Site. The southwest corner of the Site is at a topographic low point, suggesting that this region of the Site is at high risk due to ponding of overland flows collecting within the depressed region of the Site. Whilst this area of the Site is indicated to be at high risk of pluvial flooding, the proposed nursery and car parking are not to be located within this high risk area and instead situated within areas of the Site considered to be at low risk of pluvial flooding.
- 5.4.3. Any potential for additional pluvial flood risk from the proposed development should be mitigated by the implementation of a surface water drainage system following the development of the Site. An outline drainage plan designed to mitigate the risk of pluvial flooding following the Site's development has been provided within Section 6 of this report.

¹³ British Geological Survey Geology of Britain Map. Available from: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

- 5.4.4. The conceptual drainage strategy proposed within this report is only to provide an estimate of the size of required attenuation structures on site and indicate how the surface water generated from the development can be suitably discharged. A detailed drainage design should be produced during the detailed design phase.
- 5.4.5. Providing that the mitigation measures outlined within a suitable drainage strategy produced for the Site are adhered to, the risk posed from pluvial flooding is considered to be low.

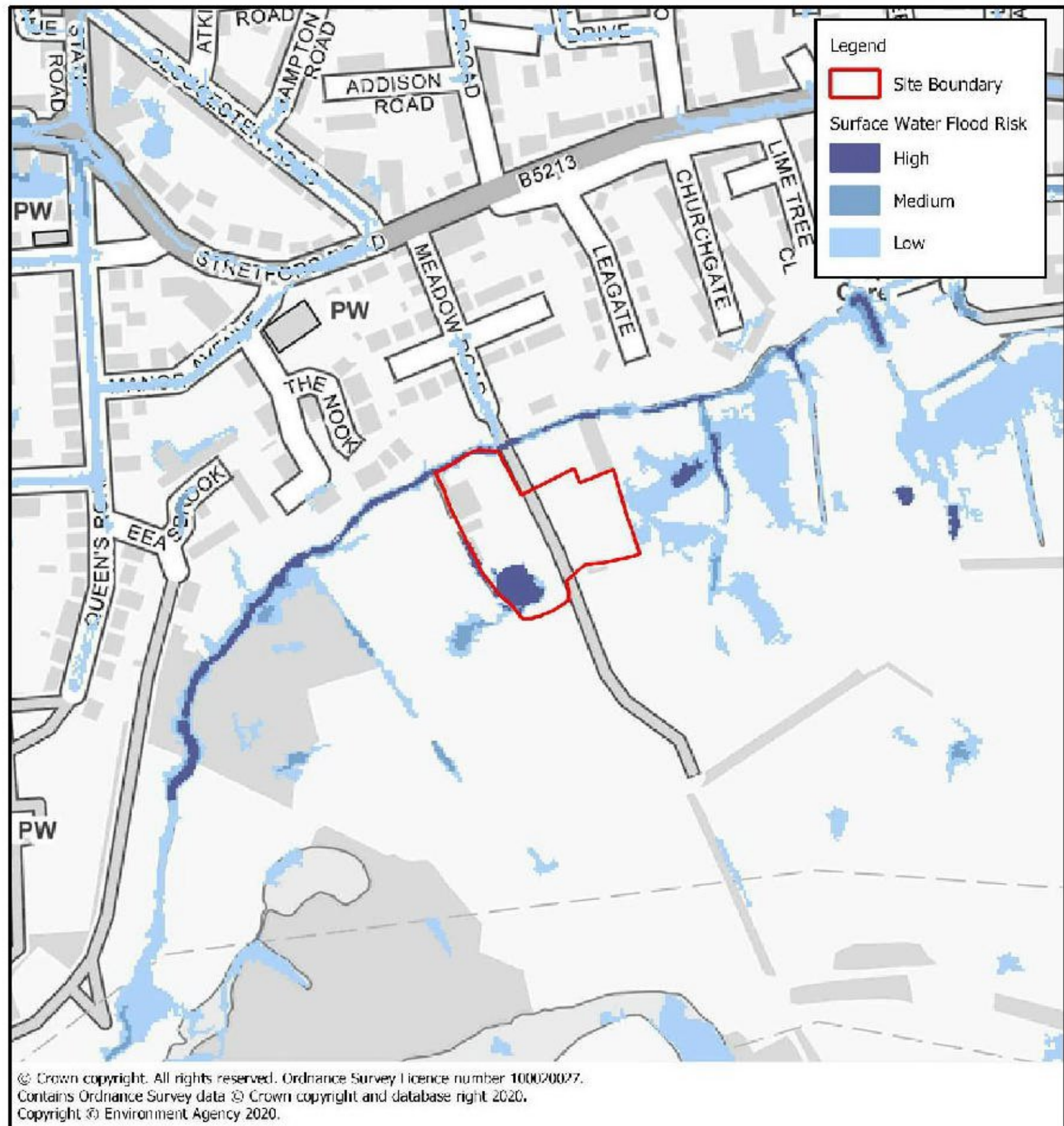


Figure 5.2: EA Long Term Flood Risk Map (Pluvial Flooding)

5.5. Flooding from Artificial Drainage Systems

- 5.5.1. UU sewer plans show that a 225mm diameter combined water sewerage network is present approximately 85m to the north of the Site, within Meadow Road. A 375mm diameter surface water sewer pipe is indicated to run from north to south, within the western side of Cob Kiln Lane, ultimately discharging into Old Eea Brook from its northern bank, adjacent to the north Site boundary.

- 5.5.2. Due to the topography of the Site and the surrounding area, if either of the aforementioned public sewerage networks north of the Site were to flood, the resulting flood water would flow towards the Site and into Old Eea Brook.
- 5.5.3. Although the Site is designated to lie within a CDA, the Manchester, Salford and Trafford Level 1 SFRA does not state the Site to be within an area known to sewer flooding. Furthermore, as the surrounding sewerage infrastructure is publically owned, UU are responsible for frequent inspections and maintenance of the sewer networks within the vicinity.
- 5.5.4. Based on the above information, the risk of flooding from sewer flooding is considered to be low.
- 5.6. **Flooding from infrastructure failure**
- 5.6.1. The EA's long term reservoir flood risk map shows that the Site lies within an area at risk of flooding from the failure of a nearby reservoir.
- 5.6.2. EA reservoir mapping also indicates that in the event of a reservoir failure, the maximum flood depth experienced within the Site will range between 0.3m to 2.0m and the maximum flood speed during the event would be below 0.5 m/s for a majority of the Site, with isolated areas of the Site experiencing maximum flows of up to 2.0 m/s.
- 5.6.3. Reservoir failure flood risk mapping displays a worst-case scenario and is only intended as a guide to identify the areas at risk of flooding from the failure of a reservoir. The probability of such a flood event occurring is considered to be extremely low as reservoirs are required to undergo rigorous inspections and maintenance regimes by United Utilities (UU) and/or the Lead Local Flood Authority (LLFA) for the area the reservoir is situated.
- 5.6.4. The risk associated with flooding resulting from the failure of the nearby reservoir is considered to be very low. However, in the extremely unlikely event that the reservoir was to fail, the impact event is expected to be high, with impacts ranging from evacuations, to significant damage to property and even loss of life. Emergency service early warnings should usually be expected.

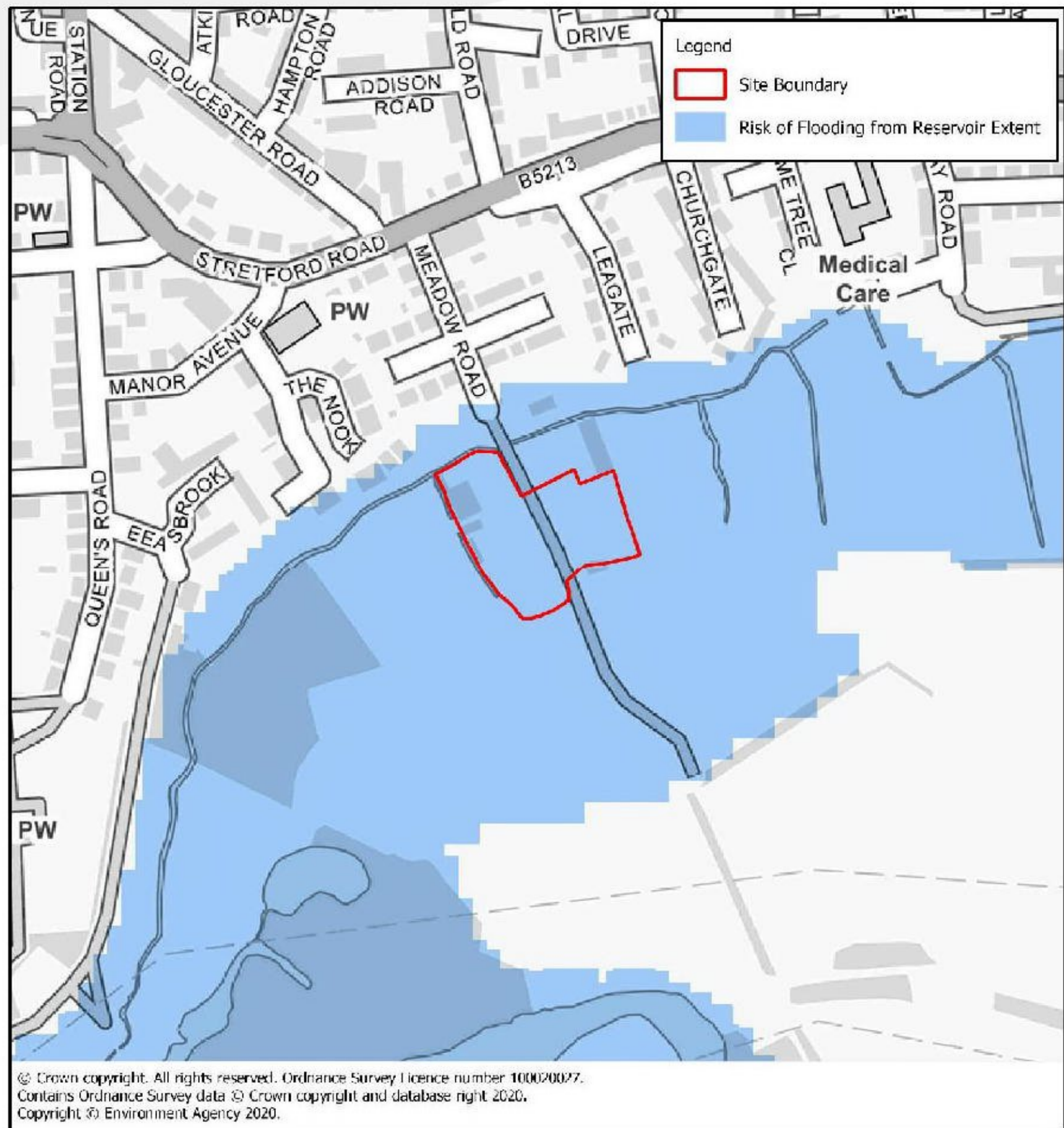


Figure 5.3: EA Long Term Flood Risk Map (Reservoir Flooding)

- 5.6.5. Old Eea Brook is culverted at the point where Cob Kiln Lane crosses the brook adjacent to the north Site boundary. In the unlikely event of blockage or collapse of the culvert, the Site would be at risk of flooding associated with the resultant impeded flow within Old Eea Brook.
- 5.6.6. From the Site walkover the culvert was identified to consist of a large pipe (approximately 1.2m in diameter) upstream and a 2m wide box culvert downstream. Therefore, the risk of blockage of the culvert is considered to be low.
- 5.6.7. It is the responsibility of the riparian owner of the culvert to ensure that it is maintained in good condition and any excess vegetation is cleared to reduce the risk of future blockage. If the culvert becomes damaged or significantly blocked to an extent that the riparian land owner cannot safely clear the culvert, the EA should be contacted to help repair the culvert and reduce immediate risk of culvert failure. So long as the condition of the culvert is monitored and any excess vegetation cleared, the flood risk associated with the culvert is considered to be low.

6.0 CONCEPTUAL DRAINAGE STRATEGY

6.1. Surface Water Drainage Strategy

- 6.1.1. As the drainage regime within the Site is considered to be Greenfield, existing surface water runoff rates will be consistent with the Greenfield runoff rates calculated for the Site area.
- 6.1.2. A Greenfield runoff rate estimate for the site was conducted using the UKSUDS Greenfield runoff estimation tool (available from: <https://uksuds.worldsecuresystems.com/drainage-calculation-tools/greenfield-runoff-rate-estimation>, accessed 23/11/2020) and are tabulated below. The Greenfield runoff rate estimation output has been provided within Appendix 5.

Return Period	Greenfield Runoff Rate (l/s)
1:1 year	0.55
1:2 year (Qbar)	0.63
1:30 year	1.07
1:100 year	1.31

Table 6-1: Greenfield Runoff Rates

- 6.1.3. The CIRIA C753 SuDS Manual v6¹⁴ states that to ensure the site does not have a detrimental impact on the downstream catchment, designers should ensure that the destination for surface water runoff that is not collected for use should be prioritised in the following order:
- Infiltration
 - Discharge to surface waters
 - Discharge to a surface water sewer, highway drain or another drainage system
 - Discharge to a combined sewer
- 6.1.4. From a desktop and Site walkover review of ground conditions, the Site is considered to have unfavourable conditions for the inclusion of soakaway/infiltration systems within the surface water drainage strategy. Despite a high level review indicating unfavourable conditions for infiltration, it is still recommended that on-site infiltration testing is carried out to confirm the suitability of infiltration SuDS use within the proposed development.
- 6.1.5. As the infiltration potential of the Site is currently unknown, it is proposed that surface water runoff from the Site is discharged to either Old Eea Brook, or the unnamed ditch, both of which are adjacent to the Site's north and west boundary, respectively.
- 6.1.6. As the proposed development is for a Children's nurse and may have a life expectancy exceeding 75 years, a 40% increase in peak rainfall intensity has been applied to the drainage design to account for the impact of climate change over the lifetime of the development, in accordance with the NPPF and the EA guidance document 'Flood Risk Assessments: Climate Change Allowances'.

¹⁴ CIRIA C753 – The SuDS Manual V6 (2015). Available from: https://www.ciria.org/Memberships/The_SuDs_Manual_C753_Chapters.aspx

- 6.1.7. Correspondence with Trafford Council, the Lead Local Flood Authority (LLFA) for the Site suggests that the council would be happy for the Site to drain into Old Eea Brook at a maximum discharge rate equivalent to the calculated Greenfield runoff rates for the Site tabulated within this report. Where Greenfield runoff rates are below 5.0l/s it is proposed that the discharge rate from the Site be set to 5.0l/s, so as to reduce the risk of blockage to the outfall from vegetation growth. Correspondence with the LLFA has been provided within Appendix 6.
- 6.1.8. The Quick Storage Estimate (QSE) facility within MicroDrainage 2020.1 software provides an estimate for the volume of storage required on site using a specified proposed impermeable area and maximum allowable surface water discharge rate.
- 6.1.9. A proposed impermeable area of 0.277 ha, measured from the conceptual site plan (drawing no. ebr/00609/A0.14) was used for the QSE calculation. The maximum allowable surface water discharge rate was set to 5.0l/s, as per the recommended minimum discharge rate to reduce the risk of blockage from debris. The indicated attenuation volume from the QSE for the 1 in 100 year plus (40%) climate change event is estimated to range between 110m³ to 160m³. The inputs and outputs for the MicroDrainage QSE have been presented within Appendix 5.
- 6.1.10. This outline drainage strategy proposes that the surface water runoff generated from the development is attenuated by permeable paving with a lined subbase located within the proposed car parking and outdoor play space. The surface water flows are proposed to discharge into Old Eea Brook at the north Site boundary, utilising an orifice plate at the point of discharge to ensure that the maximum discharge rate from the Site does not exceed 5.0l/s.
- 6.1.11. Using the MicroDrainage 2020.1 Source Control module it was calculated that the surface water runoff generated from the impermeable areas of the proposed development could be entirely attenuated within the Site by installing permeable paving with a minimum 200mm deep subbase, lined with an impermeable membrane, located within the proposed car parking and outdoor play space.
- 6.1.12. It should be noted that the permeable paving subbase is to be lined with an impermeable membrane located at the base of the subbase (200mm below the cover level of the permeable paving) as it is not confirmed that infiltration is viable for the development and this strategy is proposing for surface water to be discharge directly into Old Eea Brook and not the ground. The proposed minimum of 200mm depth subbase is required for attenuation of surface water, however a greater depth of subbase may be required for structural loading purposes within the proposed car parking area.
- 6.1.13. During the critical storm event (180 minute winter event) for the 1 in 100 year return period (+ 40% climate change) 110.4m³ of surface water will be attenuated within the permeable paving subbase, with a maximum discharge rate of 5.0l/s.
- 6.1.14. Hardstanding areas are to be graded away from the building so that in the event of a blockage or extreme rainfall, the resulting overland flow routes would be directed towards the Old Eea Brook. The Flood Route Exceedance Plan attached in Appendix 5 gives further detail.
- 6.1.15. The MicroDrainage calculation and a drawing illustrating the implementation of this outline drainage strategy (drawing no. 13565-CRH-ZZ-XX-DR-C-0001) have been presented as Appendix 5.
- 6.1.16. This preliminary Surface Water Drainage Strategy is by no means a definitive solution and should merely be used to provide an indication of the possible sizing attenuation requirements and outfall

location associated with the future development of the Site. This conceptual strategy should only be used as a guide to inform future, more detailed, surface water drainage designs for the Site.

6.2. **Foul Water Drainage Strategy**

- 6.2.1. From a review of UU Sewer Plans the only available public foul water outfall would be to the 225mm diameter combined water sewer located within Meadowgate Road approximately 85m to the north of the Site.
- 6.2.2. A pre-development enquiry was submitted to UU on 23rd November 2020, regarding the proposed connection of foul water flows from the Site into the surrounding UU sewer network. A response was received on 2nd December 2020 and has been presented within Appendix 7.
- 6.2.3. The UU correspondence states that foul waters will be allowed to drain to the 225mm combined water public sewer network at an unrestricted rate.
- 6.2.4. As the invert level of the closest available foul water sewer is indicated to be 19.43m AOD, a gravity sewer connection from the development cannot be achieved. Discharging the flows will therefore require either a pump station to discharge into the public sewer or an on-site package treatment plant will need to be installed with treated effluent discharging into the brook.

7.0 CONCLUSIONS

- 7.1.1. The Flood Risk Assessment concludes that the Site is at risk of flooding from fluvial, pluvial, groundwater and reservoir flooding. However, the risk posed from groundwater flooding is considered to be low following the development of the Site acting as a barrier to groundwater emergence. The flood risk posed by reservoir failure is considered to be very low, due to regular inspections and maintenance of the surrounding reservoirs. Pluvial flooding is only a risk in the southwest Site corner, which is to remain undeveloped, and any additional pluvial flood risk from development of the Site should be mitigated by the production of a suitable surface water drainage strategy for the development at detailed design. Fluvial flooding should be mitigated through the setting of nursery finished floor levels to be a minimum of 18.30m AOD, 300mm above the existing ground level of the proposed building footprint.
- 7.1.2. Given that the future development of the Site will be a children’s nursery, the development of the Site would be classified as “more vulnerable” under Table 2 of the NPPF guidance on flood risk and coastal change¹⁵. As per Table 3 of the NPPF guidance on flood risk and coastal change, as the Site is considered to be located almost entirely within Flood Zone 2, with a small area of Flood Zone 3 located within a proposed car parking space, the low residual flood risks to the Site and the corresponding vulnerability category of the future development, the Site is considered to be acceptable for development.

Flood Risk Vulnerability classification (See Table 2 PPG)		Essential Infrastructure	Water Compatible	Highly vulnerable	More Vulnerable	Less Vulnerable
Flood Zone (see Table 1 PPG)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	x	Exception Test required	✓
	Zone 3b Functional Floodplain	Exception Test required	✓	x	x	x

Table 7-1: NPPF 2019 Development at risk of flooding assessment criteria

¹⁵ <https://www.gov.uk/guidance/flood-risk-and-coastal-change>

- 7.1.3. The Conceptual Surface Water Drainage Strategy has been based on the proposed Site Plan (drawing no. ebr/00609/A0.14) provided on 19th April 2021 and provides an outline of the attenuation volume requirements for any potential future development within the Site. The attenuation requirements proposed within the Conceptual Drainage Strategy may be subject to change, following an increase/decrease in the proposed impermeable area and/or an increase/decrease in proposed restricted runoff rate from the Site.
- 7.1.4. A pre-development enquiry from UU confirmed that foul water flows from the development could discharge into the nearest combined sewer on Meadowgate Road. However, due to the invert level of the sewer pump station or Package Treatment Plant will be required to discharge foul flows from the development.
- 7.1.5. In conclusion, the Site is considered to be acceptable for proposed development, providing that the mitigation measures outlined within the report are adhered to during the development of the Site.

Appendix 1: Site Location Plan and Proposed Site Plan

Client
Mr & Mrs O'Sullivan

Job Title
proposed children's nursery

Land at
Cob Kiln Lane
Urmston
M41 9LB

Drawing Title
Existing site plan

Drawing Status
planning

Drawn by Date
JMR November 2020

Scale
1:1000 @ A3

Job Number Drawing Number
ebr/00546 A0.1

Revision	Description	Date

Do not scale. All dimensions to be checked on site prior to fabrication of components or execution of works. This drawing, the design and information contained within are copyright of ebrdesigns.com ltd and must not be used or reproduced without express permission. ebrdesigns.com ltd shall not be liable if used or reproduced without authorisation.



Existing Site plan



Client
Mr & Mrs O'Sullivan

Job Title
proposed children's nursery

Land at
Cob Kiln Lane
Urmston
M41 9LB

Drawing Title
Proposed site plan

Drawing Status
planning

Drawn by: JMR Date: April 2021

Scale
1:500 @ A3

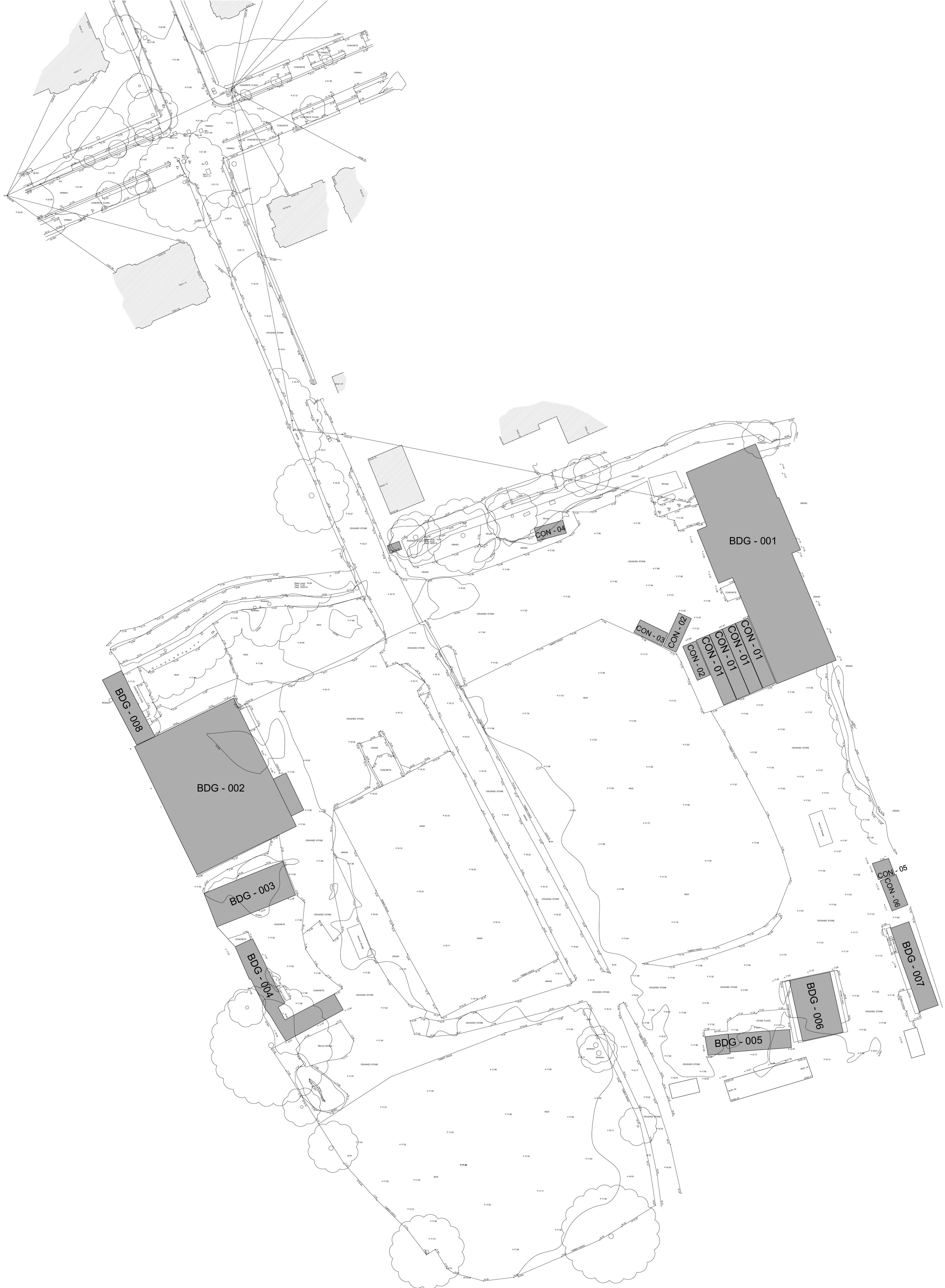
Job Number: ebr/00609 Drawing Number: A0.14

Revision	Description	Date

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Proposed site plan

Appendix 2: Ollier Smurthwaite Architects Topographic Survey



PLANNING

© Copyright Ollier Smurthwaite Architects

IMPORTANT NOTES:

REVISION	DATE	DESCRIPTION

CLIENT: TBC
PROJECT: MEADOW ROAD
ADDRESS: LIPSWICH, M41 9JT
DRAWING TITLE: TOPOGRAPHICAL SURVEY
SCALE: 1:200 @ A0
DATE: JULY 2019
DRAWING NO: A502_P_003

OLLIER SMURTHWAITE ARCHITECTS
 40 King Street, Manchester, M2 6BA
 T: 0161 883 0838
 F: 0161 883 0839
 E: mail@olliersmurthwaite.com

Appendix 3: United Utilities Sewer Plans

Ruxandra Ghita

1
Marsden St,
Manchester,
M2 1HW

FAO:

How to contact us:

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

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

Your Ref: 13204
Our Ref: UUPS-ORD-137952
Date: 25/11/2019

Dear Sirs

Location: 1 MEADOWGATE, URMSTON, MANCHESTER, M41 9LB

I acknowledge with thanks your request dated 22/11/2019 for information on the location of our services.

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

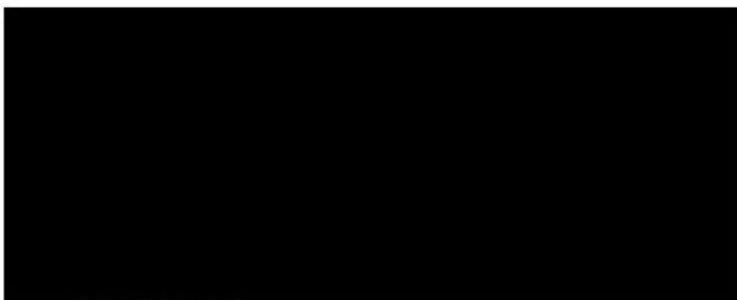
The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

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

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

If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,



Karen McCormack
Property Searches Manager

TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

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

TERMS AND CONDITIONS:

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

Appendix 4: EA Modelled Flood Data and Correspondence

Map Reference	Model Node Reference	Easting	Northing	Data	Undefended			Defended		
					1 % AEP (1 in 100 year) + 70% increase in flows	0.1 % AEP (1 in 1000 year)	0.1 % AEP (1 in 1000 year) + 30% increase in flows	1 % AEP (1 in 100 year) + 70% increase in flows	0.1 % AEP (1 in 1000 year)	0.1 % AEP (1 in 1000 year) + 30% increase in flows
7	2D Levels	376994	394245	Modelled Water Level (m aodN)	18.50	18.57	18.78	18.21	18.47	18.87
8		376985	394157	Modelled Water Level (m aodN)	18.50	18.57	18.78	18.23	18.47	18.87

Model data taken from Upper Mersey 2017 Study
 AEP - Annual Exceedence Probability
 m aodN - metres above ordnance datum Newlyn

Notes: *Climate Change Scenario - 35% and 70% increases in flow calculated for the 2080's (2070 - 2115). Please see <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances> for more information regarding the new climate change guidance. The location of the site and the type (vulnerability) of development determine the climate change allowances to consider in any flood risk assessment.

ID	NAME	TYPE	STATUS	DESCRIPTION	GROUP A										GROUP B									
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	ITEM 1	A	ACTIVE	DESCRIPTION 1	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	2.10
2	ITEM 2	B	PENDING	DESCRIPTION 2	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.10	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	4.10
3	ITEM 3	C	COMPLETED	DESCRIPTION 3	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.10	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	6.10

Additional data or notes for the first table.

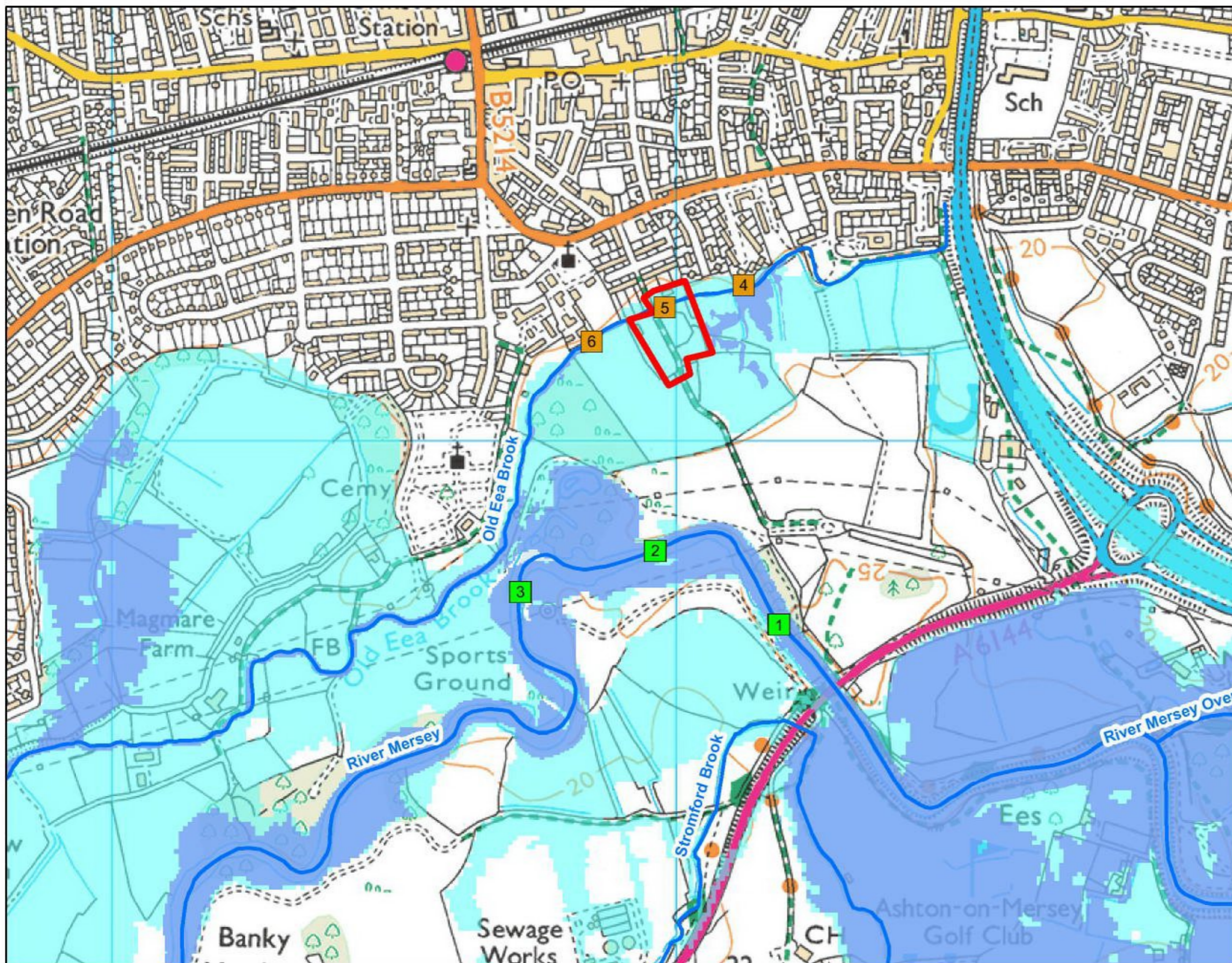
Summary or key information for the first table.

ID	NAME	TYPE	STATUS	DESCRIPTION
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5	ITEM 5	E	PENDING	DESCRIPTION 5

Additional data or notes for the second table.

Summary or key information for the second table.







Detailed Flood Map centred on Cob Kiln Lane, Urmston, Manchester, M41 9JT. Created 24/04/2019 [GMMC124023BF]



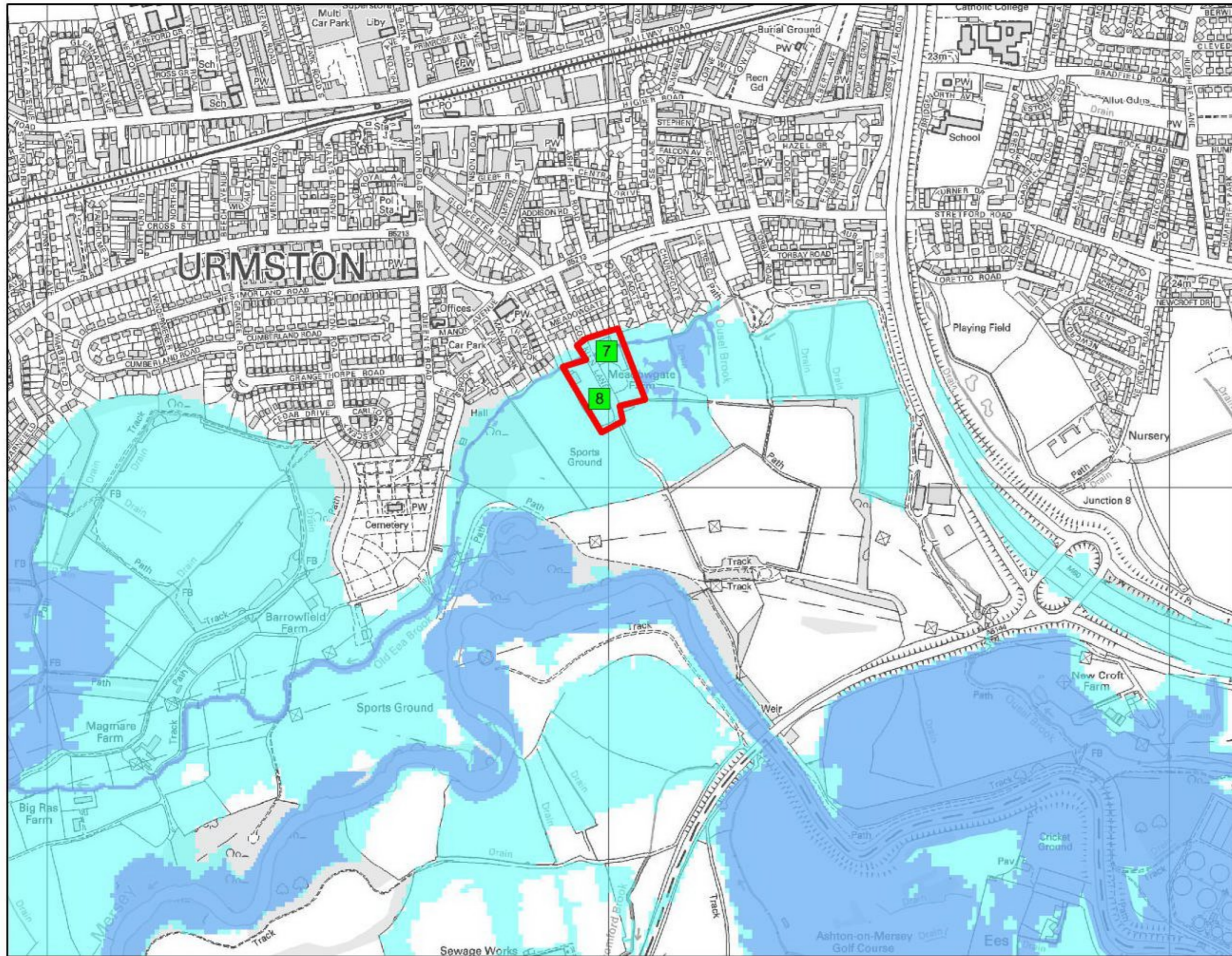
1:10,001



Legend

-  Site Location
-  Model Measurements
-  JFlow
-  Main River
-  Flood Zone 3
-  Flood Zone 2

Detailed Flood Map centred on Cob Kiln Lane, Urmston, Manchester, M41 9JT. Created 26/11/2019 [GMMC124023BF]



1:10,001



Legend

-  Site Location
-  2D Levels
-  Main River
-  Flood Zone 3
-  Flood Zone 2

Reservoir Flood Map




Note - this map provides a general indication of the largest area that might be flooded if a reservoir were to fail and release the water it holds. It is taken from a national assessment and displays a worst case scenario. The map is only intended as a guide and is not a prediction of what will happen.

Important

- This map has been produced for emergency planning purposes and displays a worst case scenario.
- It is not suitable for use at an individual property scale due to the method used.
- This map does not give any information on the likelihood of reservoir flooding or on the depth or speed of floodwaters. It also does not include any smaller reservoirs (which hold less than 25,000 cubic metres of water) or reservoirs commissioned or registered after Spring 2009.
- The information should not be interpreted as stating that the location you are interested in will or won't actually flood, but simply that it is in or not in an area that could be affected by reservoir flooding as shown on the maps.

The area within the red circle could be at risk of flooding from the following reservoirs:

Reservoir Name	Reservoir Owner	Location	Local Authority	Environment Agency Office
Sale Ees FSR	Environment Agency	379705, 393313	Trafford	Environment Agency - Greater Manchester, Merseysid
Woodhead	United Utilities Water plc	408008, 399372	Derbyshire	Environment Agency - Greater Manchester, Merseysid
Torside	United Utilities Water plc	405510, 398334	Derbyshire	Environment Agency - Greater Manchester, Merseysid

 Maximum extent of flood

1:10,000

Reservoir Flood Map

This text must be read with the extract from the Reservoir Flood Map which we have sent to you

How to use the maps

Reservoir flood maps are available to help you find out if you could be affected by reservoir flooding. Even though reservoir flooding is very unlikely it may be helpful to you to find out if you live or work in an area that could be affected. If you do, you might want to think about what you would do if an emergency did happen.

For more information on what to do if you live or work near a reservoir, including some frequently asked questions, visit our website at <http://www.environment-agency.gov.uk/flood>.

The maps have been prepared for emergency planning purposes and for this reason they reflect a credible worst case scenario – this means that if a reservoir failure did occur it would most likely be far less severe than the scenario shown in the maps. We've mapped a credible worst case scenario so that emergency planners have all the information they might need to increase public safety.

Reservoir safety

Reservoirs in the UK have an extremely good safety record with no failures resulting in the loss of life since 1925. Reservoirs are more carefully maintained now. This means reservoir flooding is very unlikely to happen.

The Environment Agency is the enforcement authority for the Reservoirs Act 1975 in England. All large reservoirs that we think could endanger human life must be inspected and supervised by reservoir engineers. We ensure that reservoirs are regularly inspected and essential safety work is carried out.

For more information on reservoir safety visit our website at:

<https://www.gov.uk/guidance/reservoirs-owner-and-operator-requirements>.

Emergency planning

Lead Local flood authorities are responsible for coordinating emergency plans for reservoir flooding and ensuring communities are well prepared. Lead Local flood authorities work with other members of the Local Resilience Forum (LRF) to develop generic and site-specific emergency plans, depending on local circumstances and priorities.

If you want to find out about local emergency plans you should contact the responsible lead local flood authority as identified on the map.

Try the new version of this page (<https://check-for-flooding.service.gov.uk/station/5008/upstream>) on the Check for flooding beta service ([what's 'beta'? \(/about-check-for-flooding-beta\)](#))

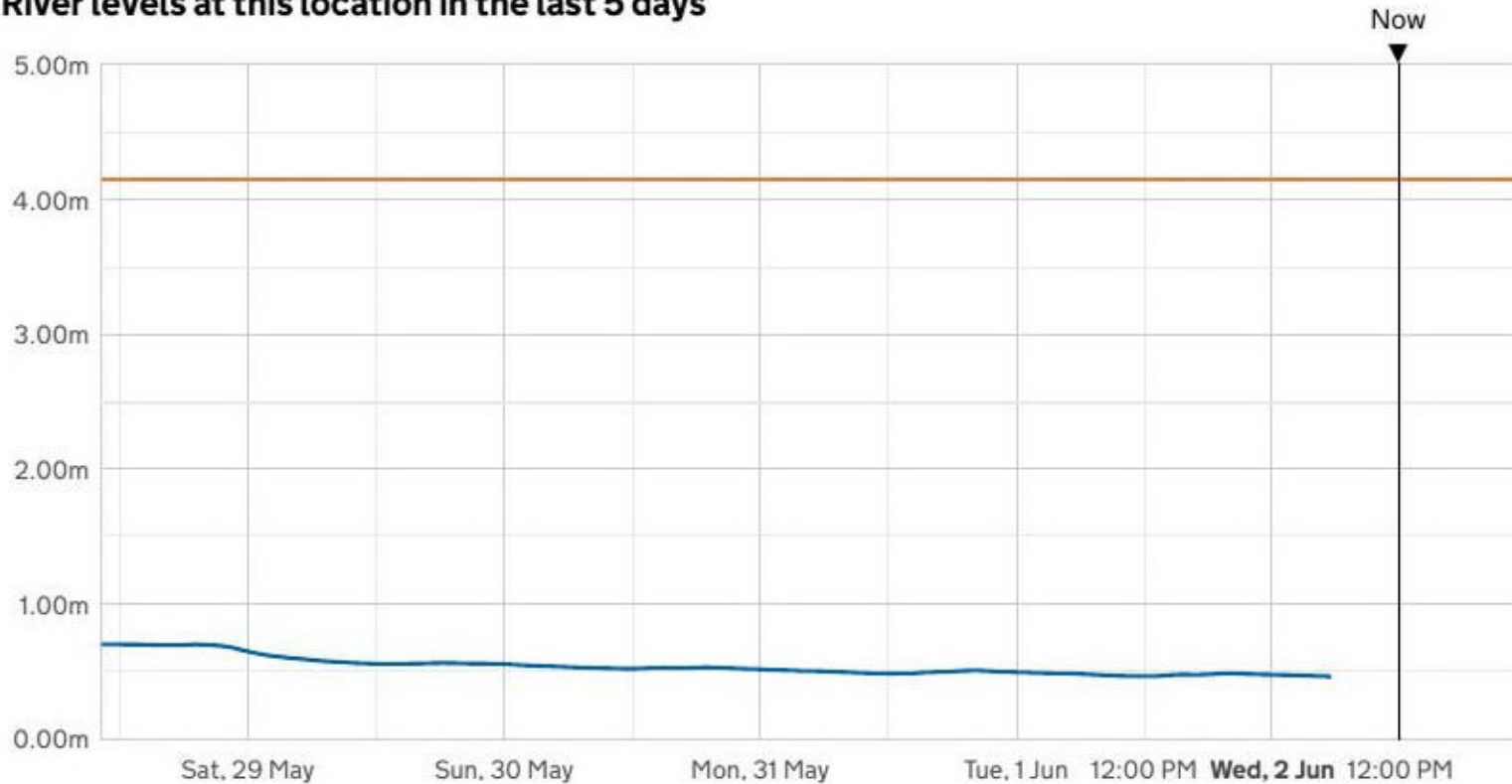
River level

River Mersey at Ashton Weir

[Check for flood warnings in this area \(/warnings?stationid=5008\)](/warnings?stationid=5008)

Latest recorded level **0.46m** at **5:30am Wednesday 2 June 2021**.

River levels at this location in the last 5 days



— Measured level

— When the water level reaches 4.15m here, minor flooding is possible in this area

[Show highest recorded level](#)


Key information

Station name: Ashton Weir
Station ID: 5008
River name: River Mersey
Typical range: 0.29m to 4.15m
Highest level on record: 3.91m on 21 January 2021
Site datum: 14.85mAOD ([what does this mean?](#))

- ▶ [How are river levels measured?](#)
- ▶ [How often are river levels measured?](#)
- ▶ [How might river levels affect flood risk?](#)

- [View nearby measuring stations \(/river-and-sea-levels?lat=53.4383198314906&lng=-2.34407967465563\)](/river-and-sea-levels?lat=53.4383198314906&lng=-2.34407967465563)
- [View the flood information service for England \(/\)](#)
- [Check the long term flood risk for an area in England. \(/long-term-flood-risk\)](/long-term-flood-risk)


Share this page

 [Twitter \(https://twitter.com/intent/tweet?](https://twitter.com/intent/tweet?original_referer&text=Important%20flood%20risk%20information%20%E2%80%93%20please%20retweet%20https%3A%2F%2Fflood-warning-information.service.gov.uk%2Fstation%2F5008%3Fdirection%3Du)

[original_referer&text=Important%20flood%20risk%20information%20%E2%80%93%20please%20retweet%20https%3A%2F%2Fflood-warning-information.service.gov.uk%2Fstation%2F5008%3Fdirection%3Du\)](https://twitter.com/intent/tweet?original_referer&text=Important%20flood%20risk%20information%20%E2%80%93%20please%20retweet%20https%3A%2F%2Fflood-warning-information.service.gov.uk%2Fstation%2F5008%3Fdirection%3Du)

 [Facebook \(https://www.facebook.com/sharer/sharer.php?u=https%3A%2F%2Fflood-warning-](https://www.facebook.com/sharer/sharer.php?u=https%3A%2F%2Fflood-warning-information.service.gov.uk%2Fstation%2F5008%3Fdirection%3Du&title=Latest%20river%20level%20information%20for%20the%20River%20Mersey%20at%20Ashto)

[information.service.gov.uk%2Fstation%2F5008%3Fdirection%3Du&title=Latest%20river%20level%20information%20for%20the%20River%20Mersey%20at%20Ashto](https://www.facebook.com/sharer/sharer.php?u=https%3A%2F%2Fflood-warning-information.service.gov.uk%2Fstation%2F5008%3Fdirection%3Du&title=Latest%20river%20level%20information%20for%20the%20River%20Mersey%20at%20Ashto)

 [Email](#)

How useful was this information?



Fw: GMMC124023BF Response Request for Flood Levels for the Old Eea Brook, Urmston

Elanna Herod to: Matthew Bailey

28/11/2019 10:43

FYI

Kind Regards

Elanna Herod
Project Engineer

CampbellReith
consulting engineers

No. 1 Marsden Street
Manchester
M2 1HW

Dear Elanna,

The officer has advised that the 1% and 1% + 35% increase in flows do not cover the site.

The site is only impacted by 1% + 70% increase in flows and the others provided in the table.

Kind regards,

Anne

From: ElannaHerod@campbellreith.com [mailto:ElannaHerod@campbellreith.com]

Sent: 28 November 2019 10:16

To: GMMC Info Requests <InfoRequests.GMMC@environment-agency.gov.uk>

Subject: RE: GMMC124023BF Response Request for Flood Levels for the Old Eea Brook, Urmston

Hi Anne,

Thank you for clarification of the data. We will use the flood zone 2 extent as recommended.

The table of the data you have sent starts at 1% AEP with 70% climate change. Would you be able to please send over the data for just the 1% AEP (1 in 100) without climate change and the 1% AEP with 35% Climate change applied so we can see the effect of climate change on our site?

Kind Regards

Elanna Herod
Project Engineer

CampbellReith
consulting engineers

No. 1 Marsden Street
Manchester
M2 1HW

Tel: +44 (0)161 819 3062

www.campbellreith.com



Dear Elanna,

Our officer has looked into the flood zones, and based on the data you are in flood zone 2. The flood zone 3 outline (to the East of the site) on the flood map provided in April was based on the Upper Mersey 2012 model (which has now been superseded by the 2017 version).


We have additionally loaded the 2D modelling and found that certain return periods covers the site (We have provided a map and table for this).

The best option would be for you to use the 2D modelling and the Upper Mersey 2017 data for the FRA. This most currant and as previously stated the "JFlow isn't suitable for a FRA"

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

Kind regards,

Anne
Anne Ball – Customer and Engagement Officer



Hi Beata,

I have a query regarding the below Product 4 data for our site and I was wondering if you could please put me in touch with someone who might be able to help clarify the data.

Essentially I am confused about the flood zone designation for our site. The attached flood map shows our site to lie within Flood Zone 2, however this is contradicted by the levels associated with JFlow node values provided. If you compare the levels at node 5 (i.e. 1% AEP level of 18.47m AOD) with our existing site levels, which range from 17.53m AOD to 18.27mAOD, then our site is presumed to be located within Flood Zone 3 with up to 1m of flooding during this event.

There is no historical records of flooding at the site and the JFlow values are considered to be broadly "generalised" and "not sufficiently accurate for use in Flood Risk Assessments" as noted in the caveat on the table.

Therefore, I would like to know which dataset is more trustworthy, the flood zone 2 extents or the JFlow data?

Is there a reason that the JFlow levels are so inaccurate or are there influencing factors such as the proximity of any nearby flood defences that may be affecting levels around our site?

Any advice would be greatly appreciated as we cannot finalise our FRA without some assurances about the correct flood zone designation.

Kind Regards

Elanna Herod
Project Engineer

CampbellReith
consulting engineers

No. 1 Marsden Street
Manchester
M2 1HW

Tel: +44 (0)161 819 3062

www.campbellreith.com



Dear Renata

Thank you for your enquiry which was received on 15/4/19.

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

I enclose the requested data.

Defences - There are no flood defences in the vicinity of the site.

Historic - We have no records of flooding affecting the site. However, this does not mean flooding has not occurred in the past or that it will not flood in future. We recommend that you also contact United Utilities and Trafford Council who may hold additional information (the former especially in relation to sewer flooding).

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:

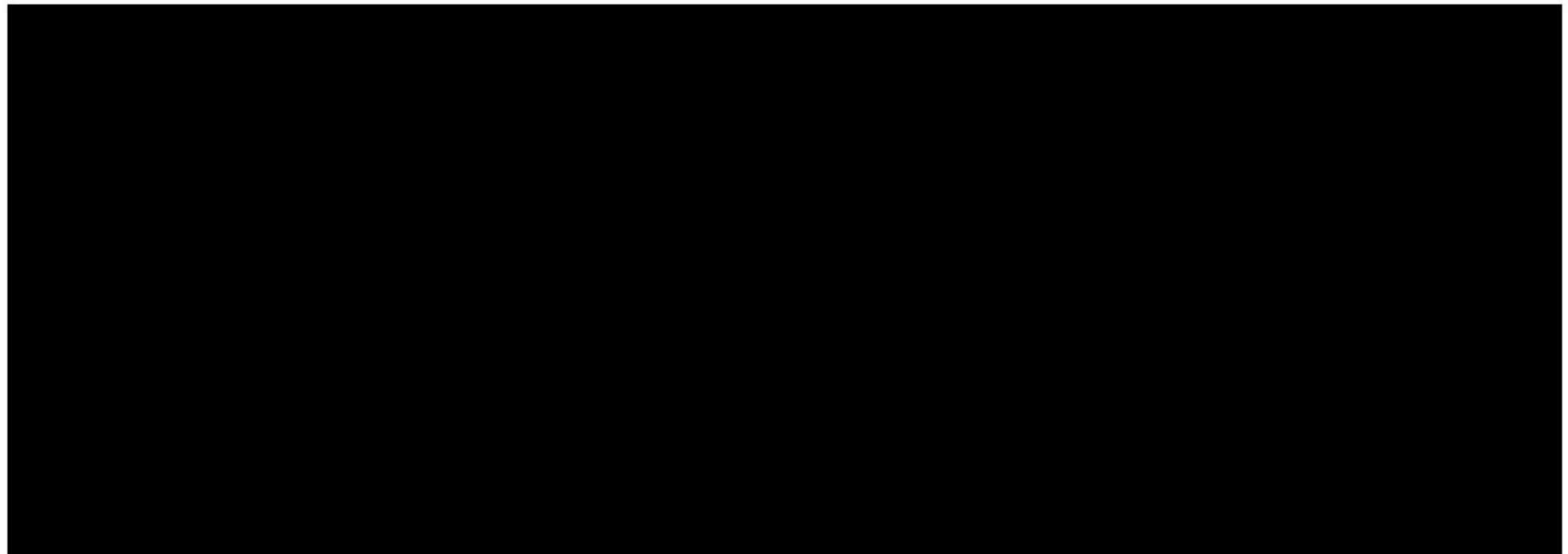
<https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities>

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

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,



Sir / Madam.

Can I please make a formal request for the Agency to supply us with flood level data for the Old Eea Brook, taken from the nearest node to the proposed Site, marked in red on the below and attached, to enable us to undertake some modelling using the existing topo survey in order to create more reliable and accurate extents of the Flood Zones for the Site.

Site Address: Cob Klin Lane, Urmston M41 9JT



Kind Regards,
Renata Bochenek-Gasiorkiewicz
Senior Civil Engineer

CampbellReith
consulting engineers

No. 1 Marsden St,
Manchester
M2 1HW

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DDI +44 (0)161 819 3067
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Dear Adrian,

Thank you for contacting the Environment Agency regarding your enquiry about flooding at Meadowgate Farm in Urmston, near Old Eea Brook. Please accept my apologies for the delay in our response.

I can confirm that the Environment Agency are aware of the flooding that occurred at this location during Storm Christoph. More specifically, we are aware of concerns that have been raised regarding the sections of high ground that separate Old Eea Brook and the River Mersey, approximate grid reference SJ7670693772. As such we completed our post flood inspections on the River Mersey and Old Eea Brook on the 2nd and 8th February respectively to assess the condition of their banks. Furthermore, one of our asset inspectors undertook a follow up inspection at Urmston Meadows on the 24th of February. During these inspections it was confirmed that this section of high ground has suffered from a notable amount of erosion, and that the River Mersey did over top its banks and enter Old Eea Brook at this location. This is likely the cause of the surcharging of Old Eea Brook and its subsequent flow upstream which you have highlighted in your email.

At present, the Environment Agency do not have any plans to undertake works on this section of high ground at the River Mersey / Old Eea Brook. This section of ground is privately owned and maintained, and as such, the responsibility of maintenance and repair falls with the riparian landowner. If you wish to identify the landowner at this location, we would suggest conducting a HM land registry search via the link below.

<https://www.gov.uk/government/organisations/land-registry>

Whilst the Environment Agency does have the ability to exercise its permissive powers to undertake maintenance, improvement or construction work on main rivers to manage flood risk, we assess each situation on a case by case basis, where we prioritise areas which are at high risk of flooding to property and people. Furthermore, any works conducted by the Environment Agency are completed using a risk based approach as we have a limited resource and restrictions on how we spend money.

Despite our best efforts we cannot guarantee, and nor do we, that flooding will not occur as a result of significant rainfall events or otherwise. As such, we are not in a position to offer compensation for such an event.

With that being said, we will still continue to monitoring the rate of erosion along the banks of the River Mersey at this location with an inspection frequency of every 6 months and should the erosion worsen, our inspectors would record this failure to the asset performance team who will action as is required.

With regards to a site visit, I have passed the request onto the relevant team members. A member of our team is currently planning to schedule in a site visit in the coming week, although I am unable to provide the exact details at this point in time. I hope you find this information. If you have any further questions please do not hesitate to contact us.

Kind regards,

Owen Bonney

FCRM – Asset Performance

Greater Manchester, Merseyside and Cheshire

Sale Depot, Carrington Lane, Sale, M33 5NL

Environment Agency

**Appendix 5: Greenfield Runoff Rate Estimation,
Surface water drainage calculations and Outline
Drainage Plan**



Notes

1. Do not scale from this drawing on print or electronically. Work from figured dimensions only.
2. No deviation from the details on this drawing is allowed without CampbellReith's prior permission in writing.
3. Read this drawing with all Architect's, Service Engineer's and CampbellReith's relevant details, specifications and drawings.
4. All work is to be done in accordance with the relevant specifications issued by CampbellReith, British Standard Codes of Practice, Statutory Requirements and the Contract Documents.
5. **Drawing status:**
P: Preliminary Evolving drawings for approvals, tenders, billings etc.
C: Construction Fully developed drawings issued under instructions for construction.
6. Only status C drawings to be used for construction.
7. **Suitability code:**
Work in progress
S0 - Work in progress
Shared (Non-contractual)
S1 - For coordination, **S2** - For information, **S3** - For internal review and comment, **S4** - For construction approval.
Documentation (For contractors purposes)
D1 - For Costing, **D2** - For Tender, **D3** - For contractor design, **D4** - for manufacture/procurement.
Construction
A - For construction, **B** - For construction but with comments (i.e. areas in abeyance), **CR** - Construction Record (Final Construction ONLY). Any deviations to that which is on site is not the liability of CampbellReith
8. **Utilities:**
 The positions of Statutory Undertakers mains & services shown on this drawing have been based on information extracted from records obtained from various Utilities Companies. These must be regarded as approximate only. The accuracy or completeness of the information or the location of such apparatus as shown on this drawing is not guaranteed and no warranty is given or implied regarding the position, depth, size, gradient thereof. The Contractor must make his own enquiries of the Utilities Companies and Public Authorities and satisfy himself as to the exact position of services and depth, sizes, gradient thereof. In the interests of safety, the approximate position of underground cables should be obtained by use of electronic cable locators and this position confirmed by careful trial-holing using hand-dug methods.
9. This outline drainage plan is based on EBR Designs Proposed Site Plan drawing 'ebr/00609/A0.14', dated April 2021 (Received from the Client on 06.05.21).
10. This Masterplan has been inserted onto the topographical survey and no guarantee as to the accuracy of the layout in relation to the survey is given or implied. Masterplan shown for information only.
11. All existing levels and survey information shown or referred to is based upon topographical survey prepared by TriCAD Solutions Ltd., drawing numbers TRI-2600-01 and TRI-2600-02, dated March 2019 - no warranty as to the accuracy of the information is given or implied.
12. For Permeable Paving MicroDrainage Source Control calculations refer to '13565-CRH-ZZ-XX-CA-C-5050', or Appendix 5 of CampbellReith Flood Risk Assessment '13565-CRH-ZZ-XX-RP-C-0001'.
13. Hardstanding areas to be graded away from the building so that in the event of a blockage or extreme rainfall, run off will flow towards the existing watercourse.

Key

	Approximate Site Boundary
	Proposed Surface Water Pipes and Manholes (Indicative)
	Existing United Utilities Combined Water Pipes and Manholes
	Proposed Permeable Paving (Indicative)
	Surface Water Flood Route

P1	Issued for information	XX/04/21	RF
Rev	Description	Date	By

CampbellReith
consulting engineers

London 020 7340 1700 Manchester 0161 819 3060
 Surrey 01737 784 500 Birmingham 01675 467 484
 Bristol 0117 916 1066 Dubai 00 971 4345 7088
 www.campbellreith.com

Job Title
Land at Cob Kiln Lane, Urmston

Client
EBR Designs Ltd

Flood Route Exceedance Plan

Drawn by	Date made	Scale @ A1	Checked by	Suitability	CR Project
RF	21/04/21	1:500	EH	S2	13565

Project No.	Originator	Volume	Lvl/Loc	Type	Role	Number	Rev
13565	CRH	ZZ	XX	DR	C	4600	P1

Design not suitable for construction purposes at this stage.



estimation for sites

www.uksubs.com | Greenfield runoff tool

Calculated by:

Site name:

Site location:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:

Longitude:

Reference:

Date:

Runoff estimation approach

Site characteristics

Total site area (ha):

Methodology

Q_{BAR} estimation method:

SPR estimation method:

Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	844	844
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

Notes**(1) Is $Q_{BAR} < 2.0$ l/s/ha?**

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	0.63	0.63
1 in 1 year (l/s):	0.55	0.55
1 in 30 years (l/s):	1.07	1.07
1 in 100 year (l/s):	1.31	1.31
1 in 200 years (l/s):	1.49	1.49

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksubs.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksubs.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Quick Storage Estimate

Micro Drainage

Variables

FSR Rainfall

Return Period (years)

Region

Map M5-60 (mm)

Ratio R

Cv (Summer)

Cv (Winter)

Impemeable Area (ha)

Maximum Allowable Discharge (l/s)

Infiltration Coefficient (m/hr)

Safety Factor

Climate Change (%)

Analyse OK Cancel Help

Enter Area between 0.000 and 999.999

Quick Storage Estimate

Micro Drainage

Results

Global Variables require approximate storage of between 110 m³ and 160 m³.

These values are estimates only and should not be used for design purposes.

Variables

Results

Design

Overview 2D

Overview 3D

Vt

Analyse OK Cancel Help

Enter Area between 0.000 and 999.999

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 208 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m ³)	Status
15 min Summer	17.873	0.073	0.0	4.4	4.4	47.4	Flood Risk
30 min Summer	17.901	0.101	0.0	4.6	4.6	65.3	Flood Risk
60 min Summer	17.926	0.126	0.0	4.7	4.7	81.6	Flood Risk
120 min Summer	17.942	0.142	0.0	4.8	4.8	92.4	Flood Risk
180 min Summer	17.945	0.145	0.0	4.8	4.8	94.0	Flood Risk
240 min Summer	17.943	0.143	0.0	4.8	4.8	92.9	Flood Risk
360 min Summer	17.936	0.136	0.0	4.8	4.8	88.0	Flood Risk
480 min Summer	17.928	0.128	0.0	4.7	4.7	83.4	Flood Risk
600 min Summer	17.921	0.121	0.0	4.7	4.7	78.9	Flood Risk
720 min Summer	17.915	0.115	0.0	4.7	4.7	74.4	Flood Risk
960 min Summer	17.901	0.101	0.0	4.6	4.6	65.8	Flood Risk
1440 min Summer	17.877	0.077	0.0	4.4	4.4	50.0	Flood Risk
2160 min Summer	17.847	0.047	0.0	4.2	4.2	30.8	Flood Risk
2880 min Summer	17.826	0.026	0.0	4.1	4.1	16.8	Flood Risk
4320 min Summer	17.803	0.003	0.0	3.9	3.9	1.8	Flood Risk
5760 min Summer	17.800	0.000	0.0	3.4	3.4	0.0	Flood Risk
7200 min Summer	17.800	0.000	0.0	2.8	2.8	0.0	Flood Risk
8640 min Summer	17.800	0.000	0.0	2.4	2.4	0.0	Flood Risk
10080 min Summer	17.800	0.000	0.0	2.1	2.1	0.0	Flood Risk
15 min Winter	17.885	0.085	0.0	4.5	4.5	54.9	Flood Risk
30 min Winter	17.916	0.116	0.0	4.7	4.7	75.0	Flood Risk
60 min Winter	17.944	0.144	0.0	4.8	4.8	93.8	Flood Risk
120 min Winter	17.965	0.165	0.0	5.0	5.0	107.3	Flood Risk
180 min Winter	17.970	0.170	0.0	5.0	5.0	110.4	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
15 min Summer	120.881	0.0	51.4	25
30 min Summer	80.193	0.0	72.0	39
60 min Summer	50.812	0.0	94.2	66
120 min Summer	31.176	0.0	118.0	122
180 min Summer	23.138	0.0	132.0	168
240 min Summer	18.623	0.0	142.5	198
360 min Summer	13.598	0.0	156.6	262
480 min Summer	10.872	0.0	167.1	332
600 min Summer	9.137	0.0	175.7	400
720 min Summer	7.924	0.0	182.9	468
960 min Summer	6.324	0.0	194.8	604
1440 min Summer	4.594	0.0	211.3	864
2160 min Summer	3.332	0.0	228.3	1232
2880 min Summer	2.650	0.0	239.8	1584
4320 min Summer	1.916	0.0	256.2	2216
5760 min Summer	1.520	0.0	266.4	0
7200 min Summer	1.270	0.0	273.3	0
8640 min Summer	1.096	0.0	278.0	0
10080 min Summer	0.967	0.0	281.3	0
15 min Winter	120.881	0.0	58.9	25
30 min Winter	80.193	0.0	82.0	39
60 min Winter	50.812	0.0	106.9	66
120 min Winter	31.176	0.0	133.1	122
180 min Winter	23.138	0.0	149.4	176

Raven House
29 Linkfield Lane
Surrey RH1 1SS

Land at Cob Kiln Lane
SW Drainage Calcs P2
Permeable Paving SuDS



Date 12/05/2021
File paving calcs.SRCX

Designed by RF
Checked by EH

XP Solutions

Source Control 2020.1

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m ³)	Status
240 min Winter	17.968	0.168	0.0	5.0	5.0	109.1	Flood Risk
360 min Winter	17.959	0.159	0.0	4.9	4.9	103.2	Flood Risk
480 min Winter	17.949	0.149	0.0	4.9	4.9	96.6	Flood Risk
600 min Winter	17.938	0.138	0.0	4.8	4.8	89.9	Flood Risk
720 min Winter	17.928	0.128	0.0	4.7	4.7	83.1	Flood Risk
960 min Winter	17.908	0.108	0.0	4.6	4.6	69.9	Flood Risk
1440 min Winter	17.872	0.072	0.0	4.4	4.4	46.5	Flood Risk
2160 min Winter	17.830	0.030	0.0	4.1	4.1	19.7	Flood Risk
2880 min Winter	17.805	0.005	0.0	3.9	3.9	3.1	Flood Risk
4320 min Winter	17.800	0.000	0.0	3.1	3.1	0.0	Flood Risk
5760 min Winter	17.800	0.000	0.0	2.4	2.4	0.0	Flood Risk
7200 min Winter	17.800	0.000	0.0	2.0	2.0	0.0	Flood Risk
8640 min Winter	17.800	0.000	0.0	1.7	1.7	0.0	Flood Risk
10080 min Winter	17.800	0.000	0.0	1.5	1.5	0.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
240 min Winter	18.623	0.0	161.0	226
360 min Winter	13.598	0.0	177.1	282
480 min Winter	10.872	0.0	189.0	358
600 min Winter	9.137	0.0	198.9	434
720 min Winter	7.924	0.0	206.9	508
960 min Winter	6.324	0.0	219.8	650
1440 min Winter	4.594	0.0	238.9	916
2160 min Winter	3.332	0.0	258.4	1276
2880 min Winter	2.650	0.0	271.9	1564
4320 min Winter	1.916	0.0	290.8	0
5760 min Winter	1.520	0.0	303.1	0
7200 min Winter	1.270	0.0	311.7	0
8640 min Winter	1.096	0.0	317.9	0
10080 min Winter	0.967	0.0	322.5	0

Raven House
29 Linkfield Lane
Surrey RH1 1SS

Land at Cob Kiln Lane
SW Drainage Calcs P2
Permeable Paving SuDS



Date 12/05/2021
File paving calcs.SRCX

Designed by RF
Checked by EH

XP Solutions

Source Control 2020.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.380	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.277

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.092	4 8	0.092	8 12	0.092

Raven House 29 Linkfield Lane Surrey RH1 1SS	Land at Cob Kiln Lane SW Drainage Calcs P2 Permeable Paving SuDS
Date 12/05/2021 File paving calcs.SRCX	Designed by RF Checked by EH
XP Solutions	Source Control 2020.1



Model Details

Storage is Online Cover Level (m) 18.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	32.8
Membrane Percolation (mm/hr)	1000	Length (m)	66.0
Max Percolation (l/s)	601.3	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	17.800	Membrane Depth (m)	0

Orifice Outflow Control

Diameter (m) 0.060 Discharge Coefficient 0.600 Invert Level (m) 17.500



Notes

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- No deviation from the details on this drawing is allowed without CampbellReith's prior permission in writing.
- Read this drawing with all Architect's, Service Engineer's and CampbellReith's relevant details, specifications and drawings.
- All work is to be done in accordance with the relevant specifications issued by CampbellReith, British Standard Codes of Practice, Statutory Requirements and the Contract Documents.
- Drawing status:**
P: Preliminary Evolving drawings for approvals, tenders, billings etc.
C: Construction Fully developed drawings issued under instructions for construction.
- Only status C drawings to be used for construction.
- Suitability code:**
Work in progress
S0 - Work in progress
Shared (Non-contractual)
S1 - For coordination, **S2** - For information, **S3** - For internal review and comment, **S4** - For construction approval.
Documentation (For contractors purposes)
D1 - For Costing, **D2** - For Tender, **D3** - For contractor design, **D4** - for manufacture/procurement.
Construction
A - For construction, **B** - For construction but with comments (i.e. areas in abeyance), **CR** - Construction Record (Final Construction ONLY). Any deviations to that which is on site is not the liability of CampbellReith
- Utilities:**
 The positions of Statutory Undertakers mains & services shown on this drawing have been based on information extracted from records obtained from various Utilities Companies. These must be regarded as approximate only. The accuracy or completeness of the information or the location of such apparatus as shown on this drawing is not guaranteed and no warranty is given or implied regarding the position, depth, size, gradient thereof. The Contractor must make his own enquiries of the Utilities Companies and Public Authorities and satisfy himself as to the exact position of services and depth, sizes, gradient thereof. In the interests of safety, the approximate position of underground cables should be obtained by use of electronic cable locators and this position confirmed by careful trial-holing using hand-dug methods.
- This outline drainage plan is based on EBR Designs Proposed Site Plan drawing 'ebr/00609/A0.14', dated April 2021 (Received from the Client on 06.05.21).
- This Masterplan has been inserted onto the topographical survey and no guarantee as to the accuracy of the layout in relation to the survey is given or implied. Masterplan shown for information only.
- All existing levels and survey information shown or referred to is based upon topographical survey prepared by TriCAD Solutions Ltd., drawing numbers TRI-2600-01 and TRI-2600-02, dated March 2019 - no warranty as to the accuracy of the information is given or implied.
- For Permeable Paving MicroDrainage Source Control calculations refer to '13565-CRH-ZZ-XX-CA-C-5050', or Appendix 5 of CampbellReith Flood Risk Assessment '13565-CRH-ZZ-XX-RP-C-0001'.

Key

	Approximate Site Boundary
	Proposed Surface Water Pipes and Manholes (Indicative)
	Existing United Utilities Combined Water Pipes and Manholes
	Proposed Permeable Paving (Indicative)

P2	Updated to latest masterplan	xx/04/21	RF
P1	Issued for information	09/12/20	MB
Rev	Description	Date	By

CampbellReith
consulting engineers

London	020 7340 1700	<input type="checkbox"/>	<input checked="" type="checkbox"/> Manchester	0161 819 3060
Surrey	01737 784 500	<input type="checkbox"/>	<input type="checkbox"/> Birmingham	01675 467 484
Bristol	0117 916 1066	<input type="checkbox"/>	<input type="checkbox"/> Dubai	00 971 4345 7088

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Job Title
Land at Cob Kiln Lane, Urmston

Client
EBR Designs Ltd

Outline Drainage Plan

Drawn by	Date made	Scale @ A1	Checked by	Suitability	CR Project
MB	09/12/20	1:500	EH	S2	13565

Project No.	Originator	Volume	Lvl/Loc	Type	Role	Number	Rev
13565	CRH	ZZ	XX	DR	C	4500	P2



Design not suitable for construction purposes at this stage.

Appendix 6: Trafford Council Correspondence



Hi Matth

In response to your enquiry please find the following comments:

The site lies wholly within FZ2 and has parts of FZ3 along the watercourse so an FRA will need to be undertaken for the EA to assess.

As the proposal will be classed as a major development we will require a drainage strategy in accordance with the latest NPPF and Planning Practice Guidance.

Parts of the South West of the site are at a potential risk of surface water flooding (1 in 30, 1 in 100 and 1 in 1000) so this will need to be investigated as part of the FRA. I'm happy with the greenfield discharge rates but any submission will need to be supported by calculations. As infiltration is not possible, the surface water from the site must discharge to Old Eea Brook (Main River) and it should be noted that this watercourse has an 8m easement from the top of bank under the EA's byelaws.

There is a ditch/minor watercourse just to the west of the site (outside the red line boundary) which could pose a flood risk to the site. This will need to be investigated further as part of any FRA/Drainage Strategy. We promote the use of Sustainable Drainage and blue/green infrastructure and would welcome early discussion with regards to the drainage layout. Permeable surfaces must be considered for the parking areas with no surface water discharging onto any proposed highways.

Flood Zones and Flood Maps for Surface Water can be found here: <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>

Kind Regards
Gareth

Gareth Owen
Senior Engineer | Amey Consulting

ameyconsulting

Tel: 07514 933877 e: Gareth.Owen@amey.co.uk
Tatton House | 11 Caldey Road | Roundthorn Industrial Estate | Manchester | M23 9LF



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RE: Land at Cob Kiln Lane - SW Drainage discharge rate
Owen, Gareth to: MatthewBailey@campbellreith.com 23/11/2020 11:44
History:
This message has been forwarded.

Hi Matthew

Yes, my comments as previous still stand.

Regards
Gareth

Gareth Owen
Senior Engineer | Amey Consulting



Tel: 07514 933877 e: Gareth.Owen@amey.co.uk
Tatton House | 11 Caldey Road | Roundthorn Industrial Estate | Manchester | M23 9LF



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Hi Gareth,

I contacted you in November 2019 regarding a site previously called 'Meadowgate Farm' to discuss some proposed surface water discharge rates for a proposed residential development. I have attached both my outgoing email to you and your response at the time, for your reference.

Your response stated that you were happy for the Site to be drained into Old Eea Brook at Greenfield discharge rates.

Since our previous correspondence, I have been contacted by a new Site owner who is looking to develop the Site by constructing a children's nursery, whilst also retaining the existing horse paddock and stables (please see attached concept plan). I am therefore producing a Flood Risk Assessment to support an upcoming planning application for this new scheme.

I have calculated some up to date greenfield runoff rates for the Site, using the IH-124 method from the 'UKSUDS Greenfield Runoff Rate Estimation Tool' and our new rates are as follows: 1 in 1 = 1.93l/s, 1 in 2 (Qbar) = 2.22l/s, 1 in 30 = 3.78l/s & 1 in 100 = 4.62l/s. As there is a risk of blockage from vegetation located along Old Eea Brook, I am proposing that the discharge rate from the Site is limited to a maximum of 5.0l/s.

Can you confirm that this is still acceptable as was previously?

Also, if you are no longer the LLFA officer for the area, can you please direct me to the current LLFA officer?

Kind regards,

Matthew Bailey
Graduate Civil Engineer

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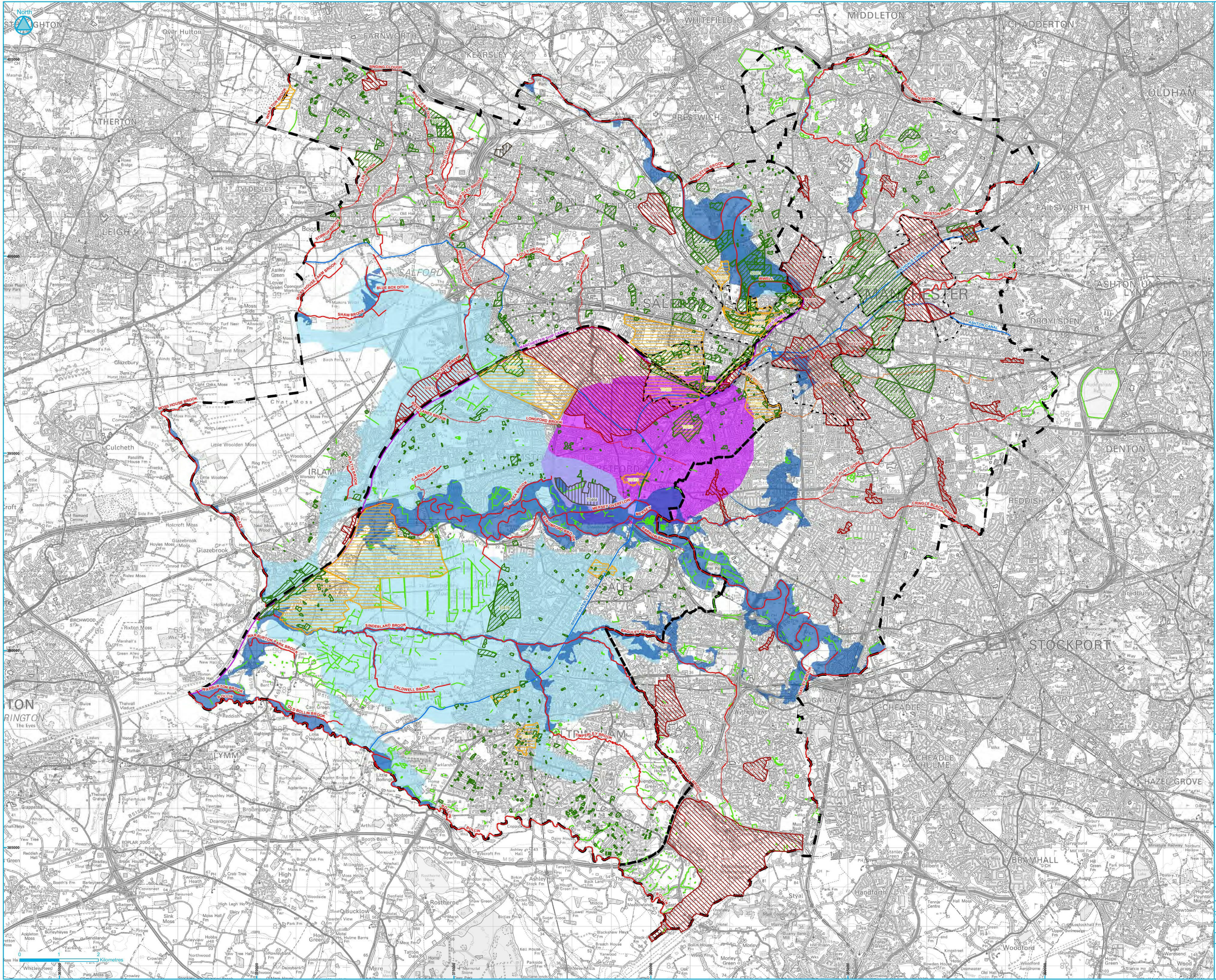
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- Council Boundary
- Ashton, Bridgewater and Rochdale Canals
- Manchester Ship Canal / Grey Irwell
- Other Waterbodies
- Groundwater Issue**
- Areas at risk of GW Flooding
- Areas of shallow GW
- Areas at risk of GW rebound
- Main Rivers (V8.0)**
- Culverted
- Open
- Potential Development Sites / Locations**
- Housing
- Mixed Use
- Other
- Regional Centre Boundary
- Digitised River Lines**
- Culverted
- Open

The map has been produced in accordance with PPS25: Development and Flood Risk and its Practice Guide. This map shows areas that are potentially at risk from groundwater flooding and should be used to scope suitable mitigation measures in a site specific Flood Risk Assessment.

The Main River information shown in the SFRA is provided by the Environment Agency; the centreline data may deviate from that shown on basemapping due to inherent differences in data resolution. Further information on Main Rivers is provided on the Environment Agency's website. The mapping of culverted sections of watercourse is a strategic screening only based upon Ordnance Survey 1:10,000 mapping and should be confirmed for more detailed studies such as site specific Flood Risk Assessment. The canals layer does not necessarily cover all the canal arms, but the modelled overtopping/breaching and hydraulic interactions with rivers and other waterbodies is complete and accurate as appropriate for a Strategic Flood Risk Assessment.

The information on the map is based on Environment Agency potential groundwater rebound areas, data from the Coal Authority, BGS drift geology mapping and Defra Groundwater Emergence Maps.

The River Irwell between Victoria Station and Pomona Island is not shown as a Main River on the Environment Agency's Flood Map although Flood Zones related to the river are. The same approach has been taken in this SFRA.

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f 0845 822772
e info@jbaconsulting.co.uk

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Warrington
WA1 1NN
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for

Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA

Groundwater Flooding

Drawn by: J Cheetham	Date: 08/03/2011	This map is based upon Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. License number: 100019668 2011.
Checked by: J Dimeslow	Date: 01/02/2011	
Approved by: J Cooper	Date: 01/02/2011	
File Name: ...ArcViewMapping\Level1\MS1_GroundwaterFlooding_V1.3.mxd		
Drawing Number: GW_2.1	Status: FINAL	Scale: 1:45,000



13204 Meadowgate Farm, Urmston - LLFA Conceptual SW Drainage
Strategy Enquiry

Matthew Bailey to: strategic.planning, access.trafford

22/11/2019 12:00

Hi - Could you please forward the following email onto Trafford Council's (TC) Flood Risk/Drainage Department, the TC planning enquiries team, or failing that, direct me to someone that may be able to help me with my below enquiry. Thank you.

To Whom it may concern,

I am currently producing a preliminary surface water management plan for a Site located off Cob Kiln Lane, Urmston M41 9LB (NGR - X: 376944, Y:394270) - Please see attached location plan,

The scheme is currently in the feasibility stage, so we don't have any proposed masterplans or internal layouts, other than the attached site boundary plan.

Our initial plan is to discharge the surface water generated on site into the watercourse 'Old Eea Brook', located along the north site boundary, limiting our discharge rate to Greenfield runoff rates (or to 5.0 l/s, where Greenfield rates are below 5.0 l/s to reduce the risk of blockage from vegetation).

Our calculated Greenfield runoff rates (calculated using the IH 124 method) are as follows: 1:1 = 2.95 l/s, 1:2 (Qbar) = 2.57 l/s, 1:30 = 5.01 and 1:100 = 6.13 l/s. We proposed to attenuate surface water flows within our site to achieve these Greenfield rates (with the exception of the 1:1 and 1:2 rates being limited to 5.0 l/s, to reduce the risk of blockage).

I am emailing to ask the council as Lead Local Flood Authority (LLFA) for the area if you have any comments/recommendations on our initial proposed concept for the surface water management plan for the site, or if this conceptual strategy would be considered as an acceptable strategy for this site, in principle?

As the scheme is currently in the feasibility stage we have not conducted any infiltration testing within the site, however from a high level review of ground conditions, infiltration is considered to be unsuitable for our site.

Any comments, recommendations or guidance you could provide us with for this site and the outlined conceptual drainage strategy would be greatly appreciated.

Many thanks,

Matthew Bailey
Graduate Civil Engineer

CampbellReith
consulting engineers

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M2 1HW

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www.campbellreith.com



A503_P_001 - Site Location Plan.pdf

**Appendix 7: United Utilities Pre-development Enquiry
Correspondence (Ref: 4200035309)**



FW: Land off Cob Kiln Lane, Urmston - Wastewater Predevelopment
Enquiry - 4200035309

Wastewater Developer Services to: MatthewBailey@camp
bellreith.com

02/12/2020 12:36

Cc: "Wastewater Developer Services"

History: This message has been forwarded.

Good Afternoon Matthew,

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

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

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

Foul Water

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

Our preferred point of discharge would be to the 225mm diameter public combined sewer within Meadowgate located to the North of your proposed development at an unrestricted rate.

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

Surface Water

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

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.

This is outlined as follows, in order of priority:

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

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

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their

input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

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

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible. However as mentioned on your email and pre development enquiry from you have submitted your proposal is to discharge surface water into Old Eea Brook. United Utilities hold no objection to this.

Waterbody

We recommend that you contact the Lead Local Flood Authority and/or Environment Agency to discuss a point of discharge to the open watercourse located to the North of the proposed site as per your proposal.

We would encourage you to identify and engage with any third party landowner and riparian owner to agree access and discharge rights to the water body if this is not in your ownership.

Public Sewer

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

Once evidence is provided as outlined above, United Utilities will consider a connection to the 375mm diameter public surface water sewer located 86mm North of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5 l/s.

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

Levels

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

Existing Water Assets Crossing the Site

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

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

Connection Application

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

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

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

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

Kind regards,

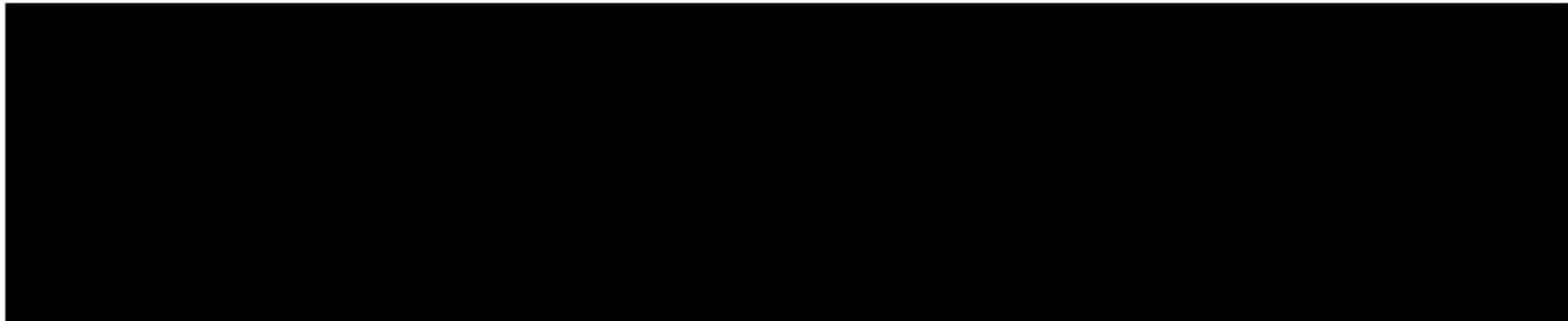
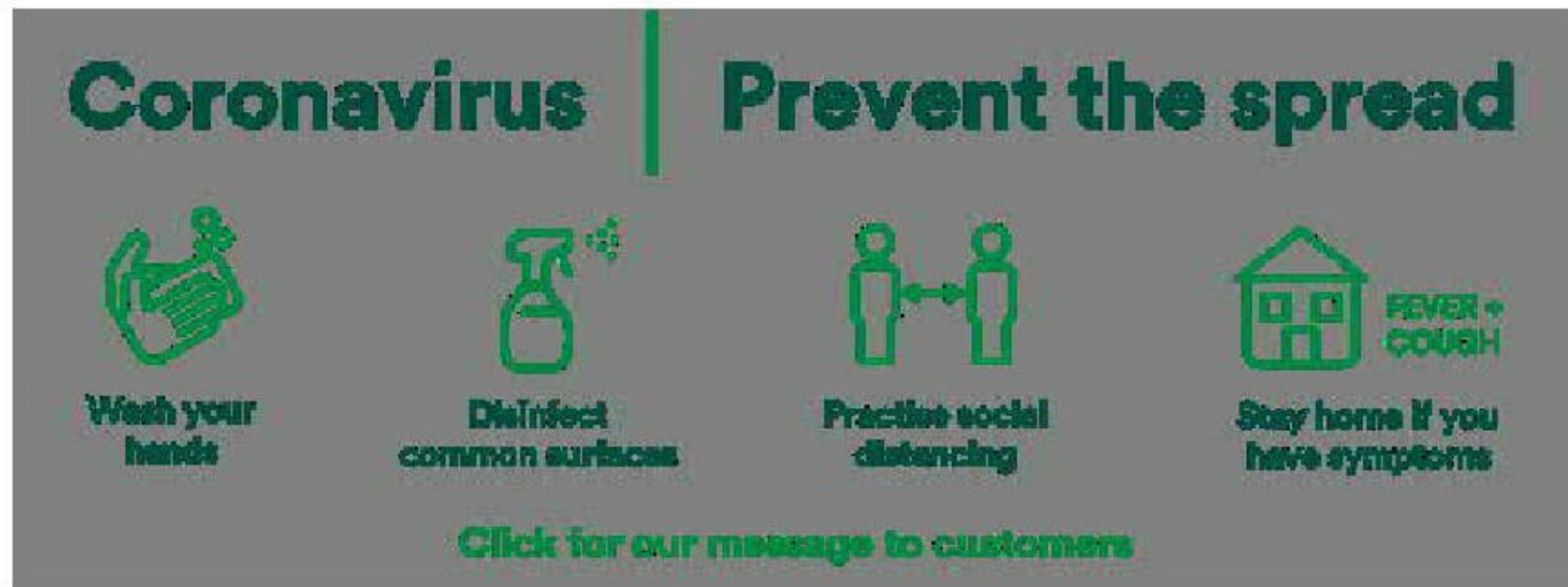


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<https://www.unitedutilities.com/builders-developers/> or you can email us at developerserviceswater@uuplc.co.uk



Hi,

Please find attached the following:

- Pre-development enquiry form
- Site location plan (& conceptual layout)
- Topographical Survey
- Ground investigation report (please note that this report was written for a different scheme located at the site (previously a 8 dwelling residential development, now 1 unit children's nursery)
- Greenfield runoff rate calcs

We previously contacted you regarding the site in Nov 2019 when the site was proposed to be for a residential development. The site is now intended to be developed to construct a children's nursery. Previous pre-development enquiry ref: 4200029262.

Currently we are proposing to discharge surface water into Old Eea Brook (adjacent to the north site boundary) @ a maximum rate of 5.0l/s, however this is still to be confirmed with Trafford Council.

Our preferred foul water outfall would be to the 225mm combined sewer in Meadows Road (as suggested by UU in the previous pre-development enquiry). The foul water flows would need to be pumped as there is an approx 3m fall in levels from the UU sewer towards our Site.

Kind regards,

Matthew Bailey
Graduate Civil Engineer

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Topo.pdf  Cob Kiln Lane_concept.pdf  Llj13204-20200204-GI Review.pdf



Greenfield runoff rate estimation tool.pdf

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