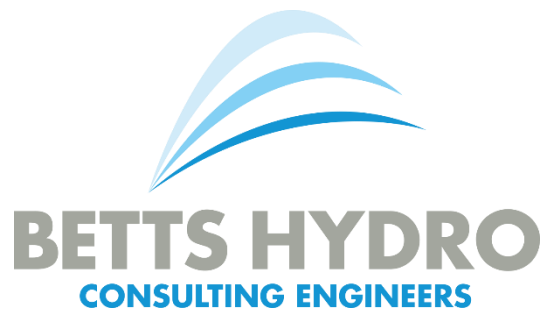


Appendix C: Hydrology and Drainage



Appendix C.1: Flood Risk Assessment and Drainage Management Strategy



LAND OFF HOLLINGWORTH ROAD LITTLEBOROUGH

FLOOD RISK ASSESSMENT AND DRAINAGE MANAGEMENT STRATEGY



For

Bloor Homes North West
2 - 4 Whiteside Business Park
Station Road
Holmes Chapel
Cheshire
CW4 8AA



JUNE 2024

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**LAND OFF HOLLINGWORTH ROAD
LITTLEBOROUGH**

**FLOOD RISK ASSESSMENT AND
DRAINAGE MANAGEMENT STRATEGY**

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EXECUTIVE SUMMARY

This Flood Risk Assessment and Drainage Management Strategy was commissioned by Bloor Homes Northwest, referred to hereafter as 'the Applicant'. This report has been prepared to support a hybrid planning application for the construction of 312no. residential dwellings, a new Primary School and associated works on land off Hollingworth Road in Littleborough.

Flood Risk

The total site covers 19.20 hectares and located within Flood Zone 1 according to Environment Agency. The proposals are mostly residential, in nature (except for the proposed primary school). The Proposed Development is therefore considered to be 'more vulnerable' within the Planning Practice Guidance which supports the National Planning Policy Framework. The Planning Practice Guidance confirms that 'more vulnerable' development is appropriate within Flood Zone 1, providing there is no increase in flood risk elsewhere due to the proposals.

This report has reviewed all sources of flood risk both to and resulting from the Proposed Development. Although there is a watercourse in proximity of the Proposed Development, as the existing topography falls away from the Site boundary towards the watercourse, the proposals are at very low fluvial flood risk. The Rochdale Canal is adjacent to the northern boundary and consultations with The Canal & Rivers Trust (CRT) have confirmed that they are not aware of any breach events in the vicinity of the Site. As the onsite levels again fall towards the canal and significantly away from the Proposed Development, the risk of flooding associated with canal is 'low'.

The Hollingworth Lake reservoir is located less than 100m to the south of Site and is elevated in comparison. The flood risk mapping shows that part of the Site would be susceptible to significant flooding should a reservoir failure occur nearby. Although reservoir flooding is highly unlikely, due to the strict maintenance and monitoring regimes implemented by the Environment Agency, as part of the Reservoirs Act 1975; if a failure was to occur there would be little or no warning and therefore preparedness is key to ensure resilience. Initial enquiries and review of the key publications has not identified any historic issues at the site associated with this reservoir although to promote community preparedness it is advised that future residents prepare a household Flood Plan, detailing the important measures to take in the event of a future flood incident.

Consultations with the Environment Agency, United Utilities, Rochdale Borough Council and Canal & Rivers Trust have been undertaken and did not identify any historical incidents of flooding on the Site. The primary flood risk potential to the Proposed Development is therefore considered to be from surface water run-off; this risk varies across the Site and is closely associated with the existing topography. The risk associated with surface water flooding will be reduced and sustainably managed post-development, following the implementation of mitigation measures proposed within this assessment.

Drainage Strategy

The principal focus of this assessment is on the sustainable management of surface water run-off to ensure no increased surface water run-off results because of the Proposed Development, in accordance with national and local policy. The surface water discharge options have been assessed in accordance with the sustainable drainage hierarchy as published in the *Sustainable Drainage System (SuDS) Manual (CIRIA 753)*. Given the presence of underlying coal measures in the sub geology and the areas mining history, an infiltration-based solution is

not likely to be practical due to the high potential for leaching of contaminants from the underlying coal measures. Furthermore, given the mining history, there is potential for further engineering constraints to be present, restricting the location of soakaway features within the Site boundaries. This issue would be exacerbated due to the steep gradient across the Site.

Assuming infiltration will not be feasible based on the information reviewed, then in accordance with the drainage hierarchy the next method to be explored is to discharge surface water run-off to a watercourse. The nearest waterbody to the Site is the Rochdale Canal, located adjacent to the northern boundary. At present flows would naturally convey north towards the canal and therefore the proposals would be to continue to do this via a formal connection (subject to relevant consents).

The canal is a private asset, and as such consent for works to this asset will be required from the asset owners. Early consultation with the Canal & Rivers Trust has been undertaken to ascertain ownership and terms for a potential new formal connection to the canal direct from the Proposed Development Site. A pre-development response from CRT has confirmed they would allow a connection into the canal at a restricted discharge rate. Technical Due Diligence work has been carried out to confirm the deliverability the proposed surface water outfall to the adjacent canal, at the restricted discharge rate agreed with Canal & Rivers Trust.

In accordance with the *Sustainable Drainage System (SuDS) Manual (CIRIA 753)* and the *Non-Statutory Technical Standards for Sustainable Drainage Systems (Department for Environment, Food and Rural Affairs, March 2015)* all sites should endeavour to achieve as close to pre-development greenfield rates as is viable. Based on the existing catchment area contributing to the canal at present, the pre-development greenfield rate (QBar) is calculated to be 13.5l/s using the Flood Estimation Handbook (FEH) Statistical Method. The proposals are therefore to restrict the surface water run-off to mimic the pre-development greenfield situation. This rate has been calculated based on the existing greenfield area (1.01ha) that currently discharges into the canal, as has been agreed and discussed with CRT.

The restricted flow will generate a storage requirement during extreme storm events. It would be beneficial to implement SuDS features where at all feasible, subject to ground investigation and a detailed levels review. If designed and located appropriately, the SuDS features such as a pond/basin could potentially aid in the attenuation requirements and provide added benefits in terms of water quality improvements. Technical Due Diligence work has been completed and confirmed that SuDS in the form of permeable surfacing, rainwater gardens, swales/basins can be incorporated into the proposals to assist with the onsite stormwater conveyance and attenuation requirements.

This Flood Risk Assessment and Drainage Management Strategy has been prepared in consultation with the relevant interested parties, including the CRT, Rochdale Borough Council, and the Environment Agency, and incorporates their comments where possible. This report is commensurate with the scale and nature of the Proposed Development and in summary, is considered appropriate in accordance with the Planning Practice Guidance.

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Specialist Software

- MicroDrainage WinDES (v.14.1) – Calculation of Greenfield run-off rates IH124/ICP-SUDS, Greenfield run-off volumes, rates of rainfall and stormwater storage estimates.
- Flood Estimation Handbook FEH– Determination of Catchment Descriptors and depths of rainfall.

Abbreviations & Acronyms

AEP	Annual Exceedance Probability
BGS	British Geological Survey
CC	Climate Change
CRT	Canal & Rivers Trust
CSAI	Cranfield Soil and Agrifood Institute
EA	Environment Agency
FEH	Flood Estimation Handbook
FRA	Flood Risk Assessment
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
mAOD	Metres Above Ordnance Datum
NGR	National Grid Reference
NPPF	National Planning Policy Framework
OS	Ordnance Survey
PFRA	Preliminary Flood Risk Assessment
PPG	Planning Practice Guidance
QSE	Quick Storage Estimate
QBAR	Mean Annual Flood
RBC	Rochdale Borough Council
SfA	Sewers for Adoption
SFRA	Strategic Flood Risk Assessment
SuDS	Sustainable Drainage Systems
TWL	Top Water Level
UU	United Utilities

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1.0 INTRODUCTION

1.1 Planning Policy Context

- 1.1.1 All forms of flooding and their impact on the natural and built environment are material planning considerations. The revised National Planning Policy Framework (NPPF, 2023) sets out the Government's objectives for the planning system, and how planning should facilitate and promote sustainable patterns of development, avoiding flood risk and accommodating the impacts of climate change.
- 1.1.2 Government policy with respect to development in flood risk areas is contained within the NPPF and the supporting Planning Practice Guidance (PPG) (refer to extracts in **Appendix A**). A Flood Risk Assessment and Drainage Management Strategy (FRA&DMS) has been completed in accordance with the NPPF and the PPG to review all sources of flood risk both to and from the Proposed Development. The report also considers the most appropriate drainage options including the implementation of Sustainable Drainage Systems (SuDS) in line with national policy.
- 1.1.3 The proposals are mostly residential, in nature (except for the proposed primary school), in accordance with Planning Practice Guidance, the most vulnerable element of the proposals on mixed-use schemes should be considered across the entire scheme in terms of classifying vulnerability. The Proposed Development is therefore considered to be 'more vulnerable' in Annex 3: Flood Risk Vulnerability Classification, within the National Planning Policy Framework. The PPG confirms that this type of land-use is appropriate for Flood Zone 1, providing there is no increase in flood risk elsewhere because of the Proposed Development.

1.2 Site Context

- 1.2.1 This FRA&DMS has been prepared to support a hybrid planning application for the construction of 312no. residential dwellings, a new Primary School, new parking, and associated works on land off Hollingworth Road in Littleborough.
- 1.2.2 The Proposed Development will be supported by with access, domestic car parking, external works and lighting, landscaping, boundary walls and fencing, external services and drainage. There is also land onsite which has been allocated for a new school which will be developed by third parties. The proposed school element will be subject to the outline approval of the overall Hybrid Application.

1.3 Consultation

- 1.3.1 The preparation of this report has been undertaken in consultation with the Environment Agency (EA), United Utilities (UU), Rochdale Borough Council (RBC) and the Canal & Rivers Trust (CRT). Consultation responses can be seen in **Appendix B, C, D** and **E** respectively. The NPPF advises that RBC as the Local Planning Authority (LPA) should consult with the EA who will provide advice and guidance on flood issues at a strategic level and in relation to planning applications.

2.0 EXISTING SITE LOCATION

2.1 Location

- 2.1.1 The Proposed Development Site (hereafter referred to as 'the Site') is located on land off Hollingworth Road in Littleborough, in the metropolitan borough of Rochdale and covers 19.20 hectares (ha). The Ordnance Survey National Grid Reference (OS NGR) for the Site is E:393361, N:415522 and the nearest postcode is OL15 0AE (refer to the Location Plan in **Appendix E**).
- 2.1.2 The Site is bounded to the north by Rochdale Canal and beyond is a railway and the River Roch. To the north-east of the Site is land that is subject to a separate planning application (REF: 21/01146/FUL) and adjacent to the eastern boundary of the Site is Hollingworth Road. To the south is Lake Bank Road with Hollingworth Lake beyond and to the west of the Site are residential dwellings, forming part of the suburb, Smithy Bridge (**Figure 1**).



2.2 Existing and Historical Land Use

- 2.2.1 The Site was historically utilised for agricultural purposes, there are records of coal deposits and mining shafts within the area also. The Site currently comprises low-density vegetation and taller shrubs/trees along its boundaries. There are also existing land drainage features both onsite and adjacent to the Site such as ponds and informal drainage conveyance routes.

2.3 Topography

- 2.3.1 A full topographical survey has been carried out and is included in **Appendix G**. In review of the topographic survey, it has been identified that the existing ground levels vary across the Site, although there is a general fall from the south-east (179.36mAOD) to the north-west (157.65mAOD).
- 2.3.2 A site walkover was undertaken by Betts Hydro in March 2019 and confirmed that ground levels varied significantly from the south-eastern corner to the northern boundary located adjacent to the canal, as shown within **Figure 2**.



Figure 2: Photograph of Site taken during Site Walkover (Betts Hydro, 2019)

3.0 DEVELOPMENT PROPOSALS

3.1 Nature of the development

- 3.1.1 This assessment is to support a hybrid planning application for the construction of 312no. residential dwellings, a new Primary School on land off Hollingworth Road in Littleborough. The residential proposals will be supported by access, car parking, external works and lighting, landscaping, boundary details, external services and drainage as indicated in **Figure 3**. The primary school will be located on the south-eastern part of the Site and developed by third parties. It will be located on an approximately 2ha site and the building itself will be circa 2,300sq.m. (see **Appendix H** for full layout).



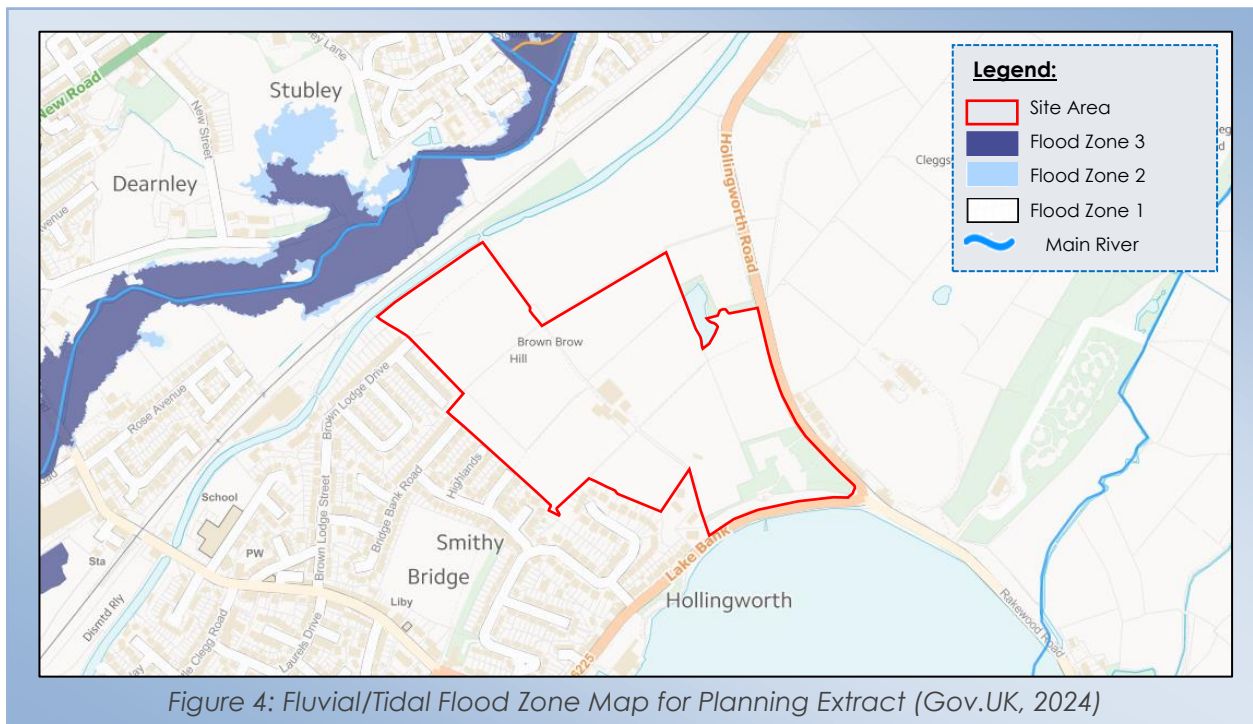
Figure 3: Illustrative Masterplan (Bloor Homes, 2024)

- 3.1.2 The masterplan covers 19.20ha and this boundary is shown by the red line within **Figure 3**, however only 12.388ha of the wider Site will be developed for residential and educational purposes, the remainder will be used for soft landscaping and open space. The land located adjacent to the north-eastern boundary of the Site is under different land ownership and is subject to a separate planning approval (21/01146/FUL).
- 3.1.3 The Site is mostly undeveloped except for several existing farm buildings. As a result, approximately 95% of the Site is permeable at present. Due to the nature of the Proposed Development however, areas of impermeable land onsite will increase. Where sustainable surface water management measures are implemented, the potential for increased flood risk to others because of the increase in impermeable areas can be effectively managed.
- 3.1.4 The proposed planning layout shows multiple areas within the wider Site to have been left as open space or green areas. It is also recommended that permeable surfacing be utilised where at all feasible within new developed areas to assist in reducing run-off generated by the Proposed Development itself. Review of the existing ground levels and the likely proposed ground levels (following regrades as per the Technical Due Diligence exercise) has identified that some areas within the Site would be suitable for the use of permeable surfacing, others however would provide too steep of a gradient to allow such measures to be practically installed.
- 3.1.5 National and local policy identifies that Sustainable Drainage Systems should be incorporated into new development where at all feasible. Given the scale and nature of the Proposed Development, there is scope to incorporate SuDS features within the design of the Proposed Development. The current proposals are to incorporate a range of SuDS features across the Site to provide maximum benefits in terms of water quantity, water quality, biodiversity, and amenity enhancements.
- 3.1.6 SuDS in the form of permeable surfacing, rainwater gardens, swales and SuDS basins are proposed to be used. The preliminary technical due diligence work shows the use of these SuDS would be practical on the Site. Detailed design will be required to confirm the specific technical details, subject to ground investigations and detailed levels review.
- 3.1.7 Review of United Utilities sewer records identified that a LDTM Raw Water Main crosses the Site from Hollingworth Lake (located south of the Site) to the Rochdale Canal (located adjacent to the northern boundary of the Site). UU have confirmed that they will require the length of the existing sewer, from the reservoir to the canal, to be protected from development in the form of a 5-6 metre (m) easement from either side of the centreline. The illustrative masterplan in **Figure 3** shows the route of this system and that the offset requirements set out by UU have been incorporated into the proposed planning layout through the inclusion of no-build, mostly soft landscaped, areas between development parcels to the east and west of the existing LDTM Raw Water Main.

4.0 SOURCES OF FLOOD RISK

4.1 Fluvial Flood Risk

- 4.1.1 Information relating to flood risk at the Site has been obtained from the Environment Agency and from the Gov.uk website. An extract of the EA's Flood Zone Map for Planning is shown in **Figure 4**, which illustrates that the Proposed Development is located entirely within Flood Zone 1. Flood Zone 1 is an area considered to be at little or no flood risk from rivers and/or the sea (as defined by the EA).



- 4.1.2 The nearest 'Main River' (as classified by the EA) to Site is the River Roch, located 450m to the north of the Site. EA mapping also identified Featherstall Brook (Main River) to be located 500m to the north of the Site and another Main River as designated by the EA to be located 600m to the south-east of the Site which is shown to flow through Hollingworth Lake. The flood risk from these Main Rivers is 'very low', due to their distance from the Site and because of the surrounding catchment topographic levels (see full mapping in **Appendix B**).
- 4.1.3 Watercourses that have contributing catchments that are not great enough to be classified as Main River by the Environment Agency are referred to as Ordinary Watercourses. There are no 'Ordinary Watercourses' located near the Site and therefore the risk from these sources is 'very low'. This is supported by the EA's Flood Zone Map for Planning.

4.2 Tidal Flood Risk

- 4.2.1 The Fylde Coastline and the Ribble Estuary are located over 50 kilometres (km) west of the Site and due to this distance, the tidal flood risk from these sources is 'low'. This is supported by the EA's Flood Zone Map for Planning (**Figure 4**).

4.3 Flood Risk Vulnerability Classification and Flood Zone Compatibility

- 4.3.1 The proposals are mostly residential, in nature (except for the proposed primary school), in accordance with Planning Practice Guidance, the most vulnerable element of the proposals on mixed-use schemes should be considered across the entire scheme in terms of classifying vulnerability.
- 4.3.2 The Proposed Development is therefore considered to be 'more vulnerable' in Annex 3: Flood Risk Vulnerability Classification, within the National Planning Practice Framework. The PPG confirms that this type of land-use is appropriate for Flood Zone 1, providing there is no increase in flood risk elsewhere due to the proposals.

4.4 Surface Water Flood Risk

- 4.4.1 Surface water flooding occurs when rainwater is unable to drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead. The risk associated with surface water run-off is indicated by the long-term flood mapping shown in **Figure 5**; an extract from the GOV.UK website).
- 4.4.2 As indicated in **Figure 5**, the Site is considered to predominantly be at 'very low' risk from surface water flooding, however there are some areas, particularly in the eastern parcel shown to be at higher risk. Generally, on undeveloped sites, the area at highest risk of surface water flooding corresponds with either existing watercourses, conveyance features, existing ponds or natural low-lying depressions.
- 4.4.3 In this case those areas onsite at highest risk from surface water flooding are associated with naturally low-lying depressions which act as natural conveyance routes through the eastern part of the wider Site. This route is neighboured by elevated land at present and would therefore be susceptible to ponding in extreme storm events.
- 4.4.4 The risk to the Proposed Development from surface water flooding will be managed and reduced, post-development through an intra-site sequential approach, by minimising the presence of more vulnerable elements of the Proposed Development within those areas of the Site at most flood risk. The planning proposals show that there have been green/blue corridors included within the wider Site to help with ensure existing conveyance routes are maintained where at all practical. Furthermore, post development the proposals will be to implement a sustainable surface water management regime to manage any additional surface water run-off generated by the Proposed Development.
- 4.4.5 Where levels or other design constraints require development within those areas shown to be at highest surface water flood risk then other mitigation measures can be considered here. To further mitigate any residual risks, it is advised that (following any re-grade of the Site) finished floor levels of proposed buildings are elevated above the external levels to provide safe overland flood routes for excess surface water run-off.
- 4.4.6 The level of raise would be dependent on the building's location in relation to those areas shown to be at greatest risk from surface water flooding. Those located in areas at little flood risk would typically be set in line with building regs to 150mm above the external ground levels to allow safe overland flow routes externally around the buildings to be maintained. For buildings located in areas shown to be at greater flood risk from

surface water, this raise in FFL can be greater depending on the potential depth of flood risk in these locations (300mm to 600mm in extreme flood risk cases). It should be noted that given the initial levels review as part of the Technical Due Diligence works undertaken there is likely to be a requirement for some levels raising to accommodate other constraints which would also in turn assist with minimising flood risk from surface water risks across the Site.

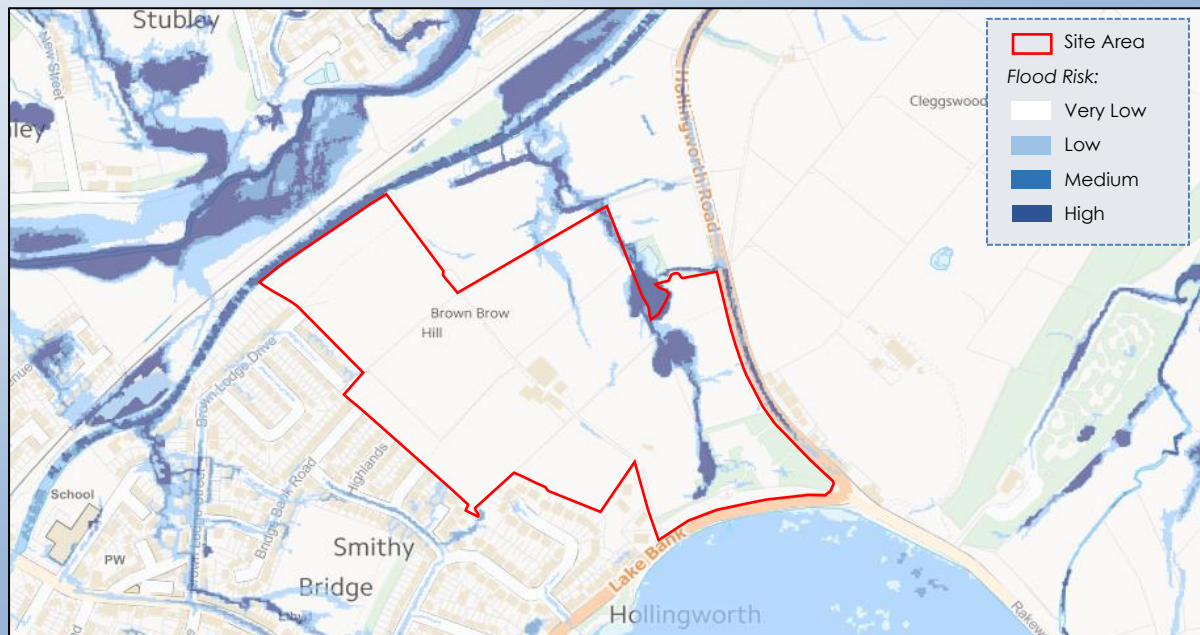


Figure 5: Surface Water Flood Map Extract (GOV.UK, 2024)

Pluvial (Overland run-off) Flood Risk

- 4.4.7 Intense rainfall that is unable to soak into the ground or enter drainage systems can run-off land and result in flooding. Local topography and the land-use can have a strong influence on the direction and depth of flow.
- 4.4.8 In this case, the topography of the surrounding undeveloped areas to the east and north, means there is little potential for overland flows to impact on the Site, as levels generally fall towards the canal to the north. The development Site is neighbored by existing development to the south-west and west, and as such does not typically generate a large amount of pluvial run-off, the potential risk from pluvial run-off impacting the Site from this direction would again be relatively low.
- 4.4.9 The volume and rate of overland flow from land can be exacerbated, if development increases the percentage of impermeable area. Any overland flows generated by the Proposed Development must be carefully controlled with safe avenues directing overland flow away from adjacent development.

Sewer Flood Risk

- 4.4.10 In urban areas, rainwater is frequently drained into surface water sewers or sewers containing both surface and wastewater known as 'combined sewers'. Foul water flooding often occurs in areas prone to overland flow and can result when the sewer is overwhelmed by heavy rainfall and will continue until the water drains away.

- 4.4.11 Review of the public sewer network records provided by United Utilities has identified multiple public sewers within the vicinity of the Site. There are public combined systems within Hollingworth Road to the east of the Site and multiple public combined and foul water systems located within the residential areas to the west of the Site.
- 4.4.12 Review of United Utilities sewer records identified that a LDTM Raw Water Main crosses the Site from Hollingworth Lake (located south of the Site) to the Rochdale Canal (located adjacent to the northern boundary of the Site). Consultations with UU have identified historical flood issues with the existing sewer length crossing the wider Site from Hollingworth Lake reservoir out falling into Rochdale Canal (see **Appendix C** for correspondence).
- 4.4.13 As noted earlier, UU have confirmed that they will require a 5-6m easement from the centreline of the LDTM Raw Water Main. UU sewer records also identify a public combined water sewer (225 millimetres in diameter (mm dia.)) located within Hollingworth Road to the east of the Site.

4.5 Groundwater Flood Risk

- 4.5.1 High groundwater levels are usually the key source of groundwater flooding, which occurs when excess water emerges at the grounds surface (or within manmade underground structures such as basements). Groundwater flooding is often more insistent than surface water flooding and would typically last for weeks/months rather than days, meaning that the result to property is often more severe.
- 4.5.2 In general terms groundwater flooding can occur from three main sources:
- If groundwater levels are naturally close to the surface, then this can present a flood risk during times of intense rainfall. No groundwater flood risk has been identified during review of the Rochdale Borough Council Strategic Flood Risk Assessment (SFRA).
 - Seepage and percolation occur where embankments above ground level hold water. In these cases, water travels through the embankment material and emerges on the opposite side of the embankment. At present there are no reported problems with groundwater flooding at the Site.
 - Groundwater recovery / rebound occurs where the water table has been artificially depressed by abstraction. When the abstraction stops, the water table makes a recovery to its original level. There is the potential for groundwater flooding in low lying areas where groundwater levels have been depressed below their pre-pumping conditions, where these were at or close to ground level. As with the seepage scenario, the likelihood of flooding from this source at the Site is low.
- 4.5.3 The EA mapping data for groundwater shows that the Site is underlain by a Secondary A Bedrock Aquifer with Secondary (undifferentiated) superficial deposits. The Site is also located within a Low Groundwater Vulnerability Zone to a Minor Aquifer. No historical flooding at or adjacent to the Site due to groundwater related sources has been identified as part of this assessment.
- 4.5.4 Irrespective, it is advised that the Finished Floor Levels (FFL) of the proposed buildings be raised sufficiently above the external levels where practical to (this is typically 150mm). The external levels design should then fall away from the proposed buildings

where practical to provide safe avenues for overland flows around/away from any proposed more vulnerable development.

4.6 Artificial Sources of Flood Risk

4.6.1 National policy states that an FRA should consider the potential risks from a variety of other flood sources including artificial sources (such as risks from reservoirs and canals).

Reservoirs

4.6.2 The EA recognises reservoirs as bodies of water over 25,000 cubic metres (cu.m) and the long-term flood mapping associated with these sources is included in **Appendix B**. The mapping shows the extents of flooding which could potentially affect the Site and the wider surrounding area in the event of a dam failure (see **Figure 6** for extract).

4.6.3 The Hollingworth Lake reservoir is located less than 100m from the Site to the south and is elevated in comparison to the existing ground levels onsite. The flood risk mapping shows that part of the Site would be susceptible to receiving significant flood depths and velocities of flood water should a failure occur in the nearby reservoir due to the Site's proximity.

4.6.4 The Reservoirs Act 1975 means that the EA ensure reservoirs (over 25,000 cu.m) are regularly inspected and safety work is carried out thus meaning a failure or breach in one of these assets is highly unlikely. Although reservoir flooding is highly unlikely, if a failure was to occur there would be little or no warning and therefore preparedness is key to ensure resilience.

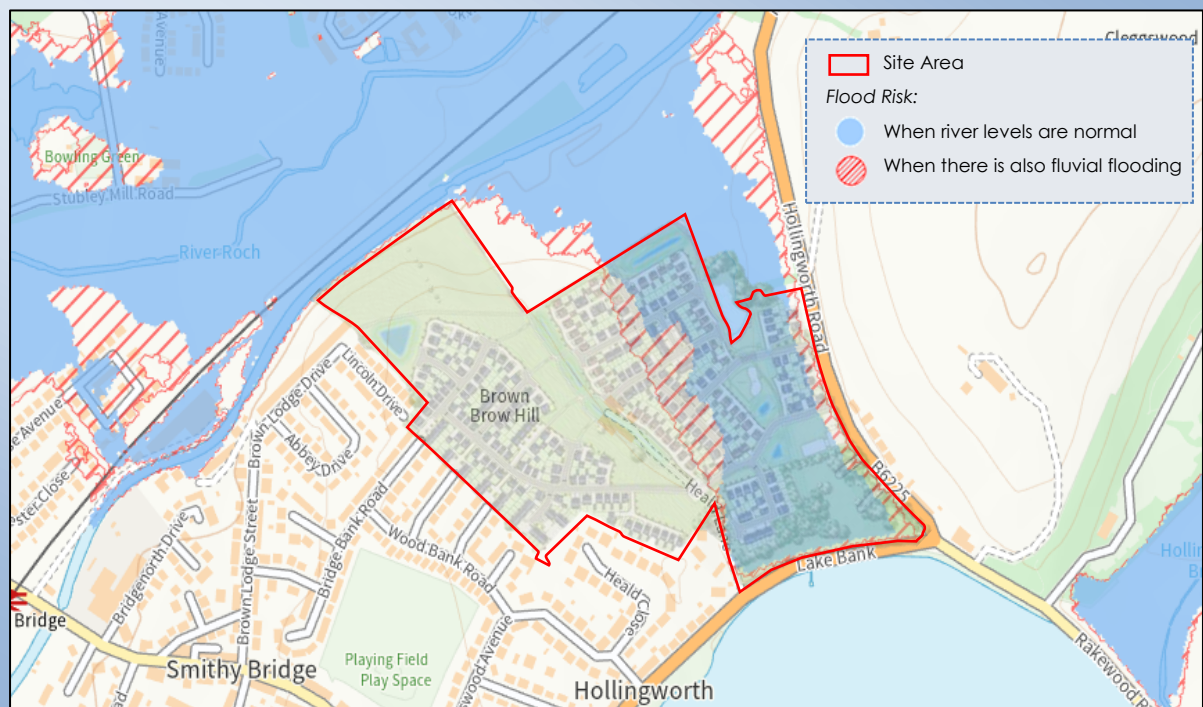


Figure 6: Reservoir Flood Extent Mapping (EA, 2024)

4.6.5 The Environment Agency provide estimates of potential depths and speeds of reservoir flooding to the Site (included in **Appendix B**); the estimated reservoir flood depths for

the Site are between 0.3m and 2m based on the anecdotal mapping. The estimated speed of reservoir flooding indicated by the online EA flood mapping data is between 0.5m/s and 2m/s for the areas of the Site at potential risk. As the estimated depths and speed of flooding are based on the 'worst-case scenario' (a reservoir failing and releasing over 25,000cu.m of water in one instance) it is considered unlikely that any flooding due to a reservoir breach would be this significant.

- 4.6.6 **Figure 6** shows the planning layout overlaid with the reservoir flood risk mapping and an avenue of flow (through the proposed greenspace) has been allowed for within the eastern part of the Site where practical. This undeveloped area can be designed to provide a safe overland flood flow route should exceedance of Hollingworth Lake to the south occur.
- 4.6.7 There are also some proposed buildings (both residential and the proposed school area) located within the eastern part of the Site which correlates with the reservoir flood risk extents. Although as discussed, the risk from reservoirs is considered residual, mitigation measures in the form of raising the finished floor levels can be proposed for any buildings located within the predicted extent to minimise the potential impacts to the buildings in this area should exceedance occur.
- 4.6.8 In terms of level of raise this is dependent upon multiple factors including location in relation to the flood risk identified and the other engineering considerations (gradients, access, and drainage). It is advised that (following any re-grade of the Site) finished floor levels of proposed buildings located within those areas at residual risk from reservoir flooding are elevated above the external levels to provide safe overland flood routes for excess run-off.
- 4.6.9 The level of raise would be dependent on the building's location in relation to those areas shown to be at greatest risk. Those located in areas at little flood risk would typically be set in line with building regs to 150mm above the external ground levels to allow safe overland flow routes externally around the buildings to be maintained. For buildings located in areas shown to be at greater flood risk this raise in FFL can be greater (300mm to 600mm in extreme cases) depending on the potential depth of flood risk.
- 4.6.10 Initial enquiries with UU and review of Rochdale Borough Council's Preliminary Flood Risk Assessment (PFRA) and Strategic Flood Risk Assessment did not identify any historic flooding of the Site related to reservoir breach. In the case of emergency, the Lead Local Flood Authority (LLFA) often prepare emergency plans in collaboration with the EA and other stakeholders to assist with improving community resilience to residual risks such as reservoir flooding. It is advised however, that residents prepare a personalised Flood Plan, detailing the procedures and important measures to take in the event of a flood incident which could potentially impact the Site.

Canals

- 4.6.11 Consultation with the Canal & Rivers Trust (CRT) has been undertaken as the Rochdale Canal is located adjacent the northern boundary of the Site. The CRT have confirmed that they are not aware of any breach events in the vicinity of the Site. Furthermore, the existing onsite levels have been identified to fall towards the canal, therefore due

to the existing topography onsite and within the neighbouring areas, the risk of flooding associated with the canal is 'low'.

- 4.6.12 Irrespective, it is advised that external levels fall away from the proposed dwellings (where feasible) to minimise the flood risk from a variety of sources. By keeping the Finished Floor Levels elevated relative to the externals, this should help create an overland flood flow route in the event of a breach or any other source of flooding that could lead to overland flows including reservoir or canal flooding.

4.7 Historical and Anecdotal Flooding Information

- 4.7.1 An internet-based search for flooding events identified flooding associated with the River Roch in 2015 to the wider Rochdale Area, however no historical flooding to the Proposed Development Site was identified. Consultation with the EA, RBC and the CRT also failed to highlight any historical flooding directly to the Site (see correspondence in **Appendix B, C and E**).
- 4.7.2 Review of the Rochdale Borough Council's PFRA and SFRA also did not highlight any historic flooding within the Littleborough area (general mapping data is included in **Appendix H**).

4.8 Flood Risk Mitigation Measures & Residual Risks

- 4.8.1 The Site is located within Flood Zone 1 and considered to be at little risk of fluvial/tidal flooding. To observe a conservative approach however, mitigation measures have been proposed below to safeguard the Proposed Development with regards to other potential residual sources of flood risk and to consider the uncertainties of climate change in accordance with the NPPF and PPG.

Mitigation Measures

- 4.8.2 For 'more vulnerable' development located within Flood Zone 1, it is typical to set the FFLs of residential dwellings typically to a minimum of 150mm above the existing ground levels. Raising the FFLs sufficiently above the external levels (following any re-grade) should mitigate any risk of flooding from a variety of sources, including groundwater and surface water run-off risks at the Proposed Development.
- 4.8.3 As some areas of the Site are shown to have had a high susceptibility to other sources of flooding (surface water and reservoir), it may be beneficial to increase the FFL freeboard to 300mm in areas of high surface water flood risk and up to 600mm in areas at risk of high risk of reservoir flooding to offer additional resilience. It would be down to the Lead Local Flood Authority to confirm their specific requirements in this case as reservoir flooding is considered a residual flood risk given the scale of the neighbouring reservoir and its likely maintenance regime enforced by the EA in line with their statutory requirements.
- 4.8.4 Additionally, for future residents to be prepared, each property should be made aware of the potential residual flood risk associated with reservoir flooding. It is advised that any future residents and the school management authority prepare specific Flood Plans, detailing the procedures and important measures to take in the event of a flood incident which could potentially impact the Site. The flood plan might include details

of important contacts such as the utility companies and insurance providers. It would also note procedures to be undertaken such as when to move items to safety, when to apply any temporary internal flood resilience measures and mechanisms of evacuation/ water levels monitoring.

- 4.8.5 Any overland flows generated by the Proposed Development must be carefully controlled. Safe avenues directing overland flow way from any existing and proposed buildings are advised. To minimise the flood risk to the neighbouring properties it is recommended that the surface water run-off generated by the Proposed Development be managed effectively with the peak rates of run-off being restricted to the equivalent of the pre-development situation (with betterment where required).
- 4.8.6 UU have however confirmed that they will require a 5-6m easement from the centreline of the LDTM Raw Water Main Sewer line which crosses through the eastern part of the Site from the reservoir into Rochdale Canal. The current planning proposals show that a no build area has been included within the planning layout to account for this routing and offset requirement.
- 4.8.7 The proposed onsite surface water drainage system will need to be sized to contain the 1 in 30yr return period event below ground with exceedance from storm events up to and including the 1 in 100yr return period storm event with a 45% allowance for climate change being contained onsite.
- 4.8.8 As with any drainage system, blockages within either the foul or surface water system have the potential to cause flooding or disruption. It is important that should any drainage systems not be offered for adoption to either UU or RBC then an appropriate maintenance regime should be scheduled with a suitably qualified management company for these private drainage systems.

Residual Risks

- 4.8.9 There are also some proposed buildings (both residential and the proposed school area) located within the eastern part of the Site which correlates with the reservoir flood risk extents. Although as discussed, the risk from reservoirs is considered residual, mitigation measures in the form of raising the finished floor levels can be proposed for any buildings located within the predicted extent to minimise the potential impacts to the buildings in this area should exceedance occur.
- 4.8.10 If an extreme rainfall event exceeds the design criteria for the drainage system it is likely that there will be some overland flows that are unable to enter the system. It is important that these potential overland flows are catered for within the Site if the capacity of the drainage system is exceeded.

5.0 SURFACE WATER MANAGEMENT

5.1 Pre-Development Surface Water Run-off

- 5.1.1 The total Site covers 19.20ha however the area for development will in this case cover a much smaller 12.388ha, this area excludes those areas onsite to remain undeveloped or utilised for Public Open Space (POS). From review of the mapping and existing topographic survey information, it is understood that the Site naturally drains with the topography overland towards the Rochdale Canal and the River Roch (via the former connections serving the adjacent Azko Nobel site to the north).
- 5.1.2 A review of the topography shows that most of the western part of the wider Site would currently drain either to the canal (via overland run-off) or to the neighbouring residential areas further west. Most of the eastern part of the Site drains with the topography either to the existing pond located to the north, to the canal via overland run-off or via the adjacent Azko Nobel drainage systems to both the canal and the nearby River Roch (as illustrated in the existing drainage plan **Figure 7**).



- 5.1.3 Although there are existing buildings present on the Site (consisting of the existing farm, outbuildings, and access) most of the development area is greenfield at present. Given that these onsite buildings are likely to drain to the surrounding areas, the Site is 100% permeable for the purpose of calculating greenfield run-off. If we consider the overall

Development Area (12.388ha), then the peak greenfield run-off rate (QBAR) is calculated to be approximately 166l/s using the FEH Statistical Method.

- 5.1.4 As discussed herein, given that not all of the development areas currently discharge into the canal (which is the proposed outfall point) this section has considered the pre-development greenfield rates generated by the existing catchment contributing to direct run-off into the canal. A separate catchment Hydrological Assessment was prepared and is appended for completeness (see **Appendix O**).
- 5.1.5 The direct contributing catchment has been identified (and agreed with Canal & Rivers Trust) to be 1.01ha (refer to correspondence in **Appendix E**). The peak rates and volumes of run-off generated by this contributing catchment has been calculated for the peak events shown in **Table 1** (full details **Appendix K**). The surface water run-off rates have been calculated using the FEH Statistical Method.

Contributing Canal Catchment Area	Run-Off Rates				Run-Off Volumes	
	1 In 1 Year	1 In 30 Year	1 In 100 Year	QBar	1 In 1 Year	1 In 100 Year
1.01ha	11.7l/s	22.9l/s	28.1l/s	13.5l/s	132.4cu.m	354.7cu.m

Table 1: Pre-Development Surface Water Run-Off Rates (Betts Hydro, 2022)

5.2 Post Development Surface Water Run-Off

- 5.2.1 At present the illustrative masterplan shows the main development areas within the wider Site to cover 12.388ha. Based on the planning layout we have estimated that the post-development impermeable areas will increase to cover approximately 55% of the Development Area. The unrestricted post-development run-off rates have been detailed in **Table 2**.

Proposed Impermeable Area	Run-Off Rates		
	1 In 1 Yr	1 In 30 Yr	1 In 100 Yr +CC
6.813ha	348.2l/s	652.9l/s	1221.1l/s

Table 2: Post-Development Un-Restricted Run-Off Rates (Betts Hydro, 2022)

- 5.2.2 In accordance with national and local planning policies it is necessary to restrict surface water run-off rates where at all practical to mimic a pre-development greenfield situation. The pre-development rates are detailed in **Table 1**. Further details of the proposed drainage strategy can be found in **Section 5.6**.

5.3 Sustainable Drainage Systems (SuDS)

- 5.3.1 In accordance with national and local planning policy, including the Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) and the SuDS Manual (CIRIA 753), peak surface water discharge rates from new development should be appropriately managed and where possible reduced. To manage surface water run-off policy shows that preference should always be given to Sustainable Drainage Systems (SuDS) over the traditional methods wherever possible and practical.

- 5.3.2 SuDS can (if designed and situated appropriately) address the four key sustainability objectives embedded in planning policy including providing space for water (water quantity), improving water quality and biodiversity, along with providing valuable amenity/recreational space within new development sites. These benefits of SuDS depend on the type of features being proposed, some typical examples relevant to this nature of development are illustrated in **Figure 8**.



- 5.3.3 Opportunities should also be taken to provide soft landscaping where at all possible on Site to assist in minimising surface water run-off. It would also be recommended that permeable surfacing and bio-filtration (tree pits) be considered in non-adopted areas where at all feasible. By including measures such as these the surface water run-off is being dealt with at source and this will assist locally with surface water management (subject to optimum ground conditions). If infiltration rates are not feasible then a connection into the proposed main drainage systems is needed, but the presence of the permeable surfaces will still allow the first 5mm of rainfall to be dealt with at source as identified in the SuDS Manual (CIRIA 753).
- 5.3.4 Promoting SuDS to deal with surface water at the source will limit the required attenuation and in turn reduce the volume of surface water in the nearby watercourse and sewer infrastructure. It is proposed that permeable surfacing and bio-filtration techniques be included within the main residential areas where practical to provide opportunity for natural uptake but also added benefits to the water quality of run-off generated in these areas. There may also be scope to incorporate rainwater collection butts and/or rain garden style raised planters (as illustrated in **Figure 8**) within the plot drainage elements to provide added water quality, amenity, and biodiversity benefits. A Simple Water Quality Management Assessment using the CIRIA SuDS Manual 'Simplified Index Approach' has been prepared considering those features currently proposed on the Site (refer to **Appendix P** for the table).
- 5.3.5 In terms of larger scale SuDS features, swales/basins have been proposed within the drainage strategy to assist with both conveyance and attenuation requirements at the Site. Given the steep gradients being considered on this Site, initial Technical Due Diligence has been carried out to consider how best to include the SuDS features noted above within the wider Site to achieve the maximum benefits for water quantity,

quality, biodiversity, and amenity. Detailed design will confirm the technical details in due course following more detailed analysis of levels, ground conditions and attenuation.

5.4 Methods of Surface Water Management

5.4.1 There are three methods that have been reviewed for the management and discharge of surface water. These may be applied individually or collectively to form a complete strategy and should be applied in the order of priority listed below:

-  Discharge via infiltration
-  Discharge to watercourse
-  Discharge to public sewerage system

5.5 Discharge via Infiltration

5.5.1 Any impermeable areas that can drain to a soakaway or an alternative method of infiltration would significantly improve the sustainability of any surface water system onsite. The published online datasets have been reviewed to consider how favourable the underlying strata is to support a potential infiltration-based solution at the Site, given there has been no onsite infiltration testing at this time to support this assessment.

5.5.2 The Cranfield Soil and AgriFood Institute (CSAI) Soilscape viewer identifies the soils on Site to be slowly permeable, seasonally wet, acid, loamy and clayey soils. The British Geology Survey (BGS) mapping data indicates the main ground conditions are composed of a bedrock of Pennine Lower Coal Measures Formation with superficial deposits of till, diamicton and sandstone.

5.5.3 Given the presence of underlying coal measures in the sub geology and the areas mining history, an infiltration-based solution is not likely to be practical due to the high potential for leaching of contaminants from the underlying coal measures. Furthermore, given the mining history there is potential for further engineering constraints to be present onsite, restricting the location of soakaway features within the Site boundaries. This issue would also be exacerbated by the steep gradient across Site.

5.5.4 Given the current Site gradients, it is unlikely that a full infiltration solution would be practical for the development proposals. Soakaway Testing on this development Site may still be required in due course to evidence that infiltration will not work. Although this is typically something that can be conditioned as part of a planning permission providing there are alternatives.

5.5.5 The proposals are still to utilise permeable surfaces in external areas where an engineerable solution can be achieved, even if a full infiltration solution is not viable. The permeable surfaces will be lined with a connection to the proposed main drainage serving the new development. The presence of the permeable surfaces will still allow the first 5mm of rainfall to be dealt with at source as identified in the *SuDS Manual (CIRIA 753)*. Other surface water discharge methods have therefore been reviewed.

5.6 Discharge to Watercourse/Waterbody

- 5.6.1 Assuming infiltration will not be practical as a full Site wide solution, based on the information reviewed, then in accordance with the drainage hierarchy the next method to be explored is to discharge surface water run-off to a watercourse/waterbody. The nearest waterbody to the Site is the Rochdale Canal located adjacent to the northern boundary. As discussed in the separate hydrological assessment, at present most of the Site would naturally convey north towards the canal or the adjacent site (which had confirmed surface water outfalls into the Rochdale Canal).
- 5.6.2 The proposals are to mimic the existing drainage regime for the Site and continue to discharge surface water run-off generated by the Site into the adjacent canal. The canal is a private asset as such consent for works to this asset will be required from the asset owners – the CRT. Early consultation with the CRT has been undertaken to ascertain ownership and terms for a potential new formal connection to the canal direct from Site.
- 5.6.3 Assessment has been undertaken of the existing contributing catchment from the Site to the adjacent canal to ensure that the proposals do not result in any increase in flood risk. It has been identified that only a small area of the wider Site currently discharges into the adjacent canal via overland runoff directly. The greenfield run-off rates generated by this direct contributing catchment have therefore been calculated as requested by CRT to identify what the maximum rate of discharge into the canal to serve the proposals would be.
- 5.6.4 A pre-development response from CRT was obtained following discussions in 2019 to 2021. This has confirmed that CRT will allow a new formal connection into the canal to serve the new development proposals, but that this must restrict the flows to no greater than 13.5l/s (see correspondence in **Appendix E**). Initial design work has been undertaken as part of a Due Diligence Exercise to illustrate that a positive outfall to the canal, at the agreed rate of restriction, can be achieved.
- 5.6.5 The initial design work considers the typical design requirements of both the LLFA and CRT along with considering the Site-specific constraints such as levels, steep gradients, and the requirement to incorporate multiple SuDS features. In terms of the proposed surface water drainage infrastructure, due to gradients and levels across the Site the proposals are to have a partial pumped solution within the Site as illustrated in **Figure 9 and 10** (subsequently).
- 5.6.6 As illustrated in the Preliminary Drainage Layout (**Appendix M**) the proposed surface water drainage infrastructure serving most of the eastern proposals and the south-western proposals drains via gravity to a low point (adjacent to the former VISTRY site to the north). Flows then convey back up from the proposed surface water pumping station to the inlet of the three proposed linear pond/swale SuDS features shown to be located centrally through the Site. Surface water flows are conveyed naturally via gravity through these linear SuDS features before entering a piped length to outfall into the canal via a newly constructed outfall in the north-western corner.
- 5.6.7 In terms of levels, the initial design work has shown that there is a small part of the proposed development area, in the north-western corner, which cannot be routed

practically into the other proposed surface water SuDS features. In this case a separate SuDS basin has been shown to serve this small area which will ultimately discharge, via gravity, into the piped surface water outfall proposed to serve the other parts of the wider Site. This initial design (prepared by Betts Associates) can be seen in the preliminary drawings found in **Appendix M**, extracts are included in **Figure 9 and 10**.

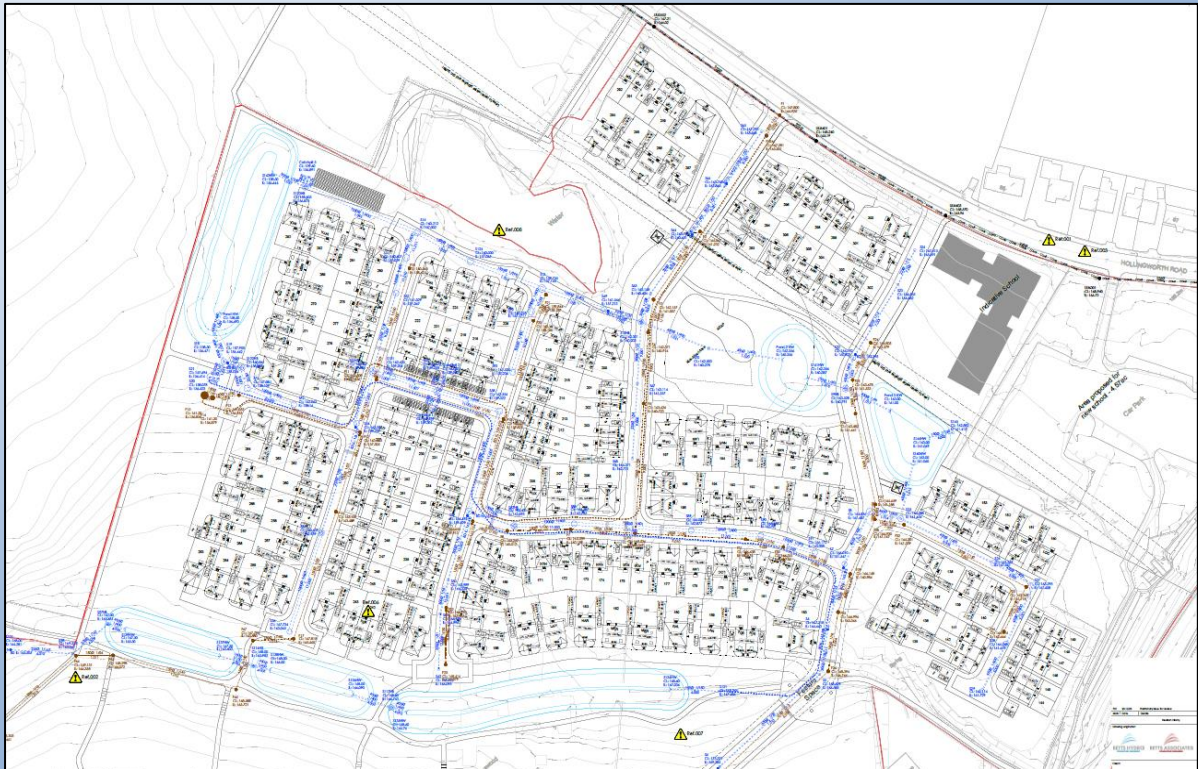


Figure 9: Preliminary Proposed Drainage Layout Sheet 1 (Betts Associates, 2024)

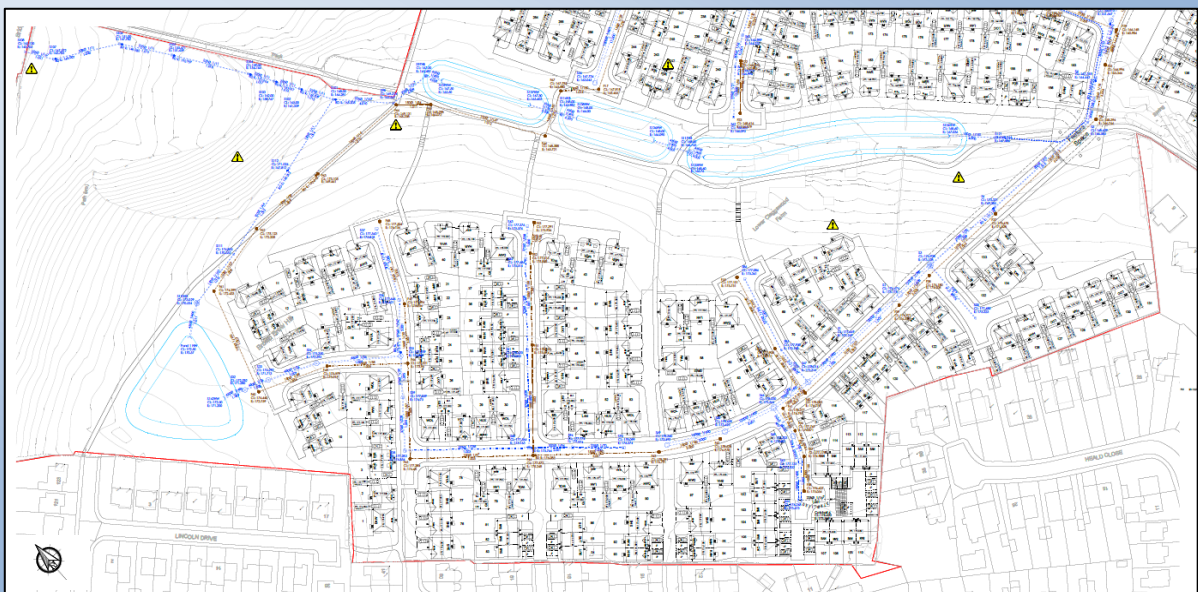


Figure 10: Preliminary Proposed Drainage Layout Sheet 2 (Betts Associates, 2024)

Proposed Rates of Discharge

- 5.6.8 In accordance with the *SuDS Manual* (CIRIA 753) and the *Non-Statutory Technical Standards for Sustainable Drainage Systems* (CIRIA March 2015) all sites should endeavour to achieve as close to pre-development greenfield rates as is viable. The proposals are therefore to restrict the surface water run-off to mimic the pre-development greenfield situation. As previously discussed, this pre-development greenfield rate has been calculated based on the existing greenfield area that was calculated to run-overland directly into the canal (1.01ha) based on the previous catchment hydrological assessment.
- 5.6.9 Based on the calculated contributing catchment area (1.01ha), the pre-development greenfield rate (QBar) is calculated to be 13.5l/s using the FEH Statistical Method (see summary in **Appendix K**). The calculated greenfield run-off rate is something which has been discussed and agreed with Canal & Rivers Trust (see correspondence in **Appendix E**) and there would be no proposals to change this already agreed figure.
- 5.6.10 Given the size of the Site and the significantly restricted discharge rate to the canal, there will be a significant requirement to provide onsite stormwater storage to accommodate extreme storm events in line with standard design parameters. The potential stormwater storage figures quoted in **Table 3** are estimates only, based on the proposed impermeable area (55% of the current Development Area shown in the planning layout). If the planning proposals change or the development density alters then those figures quoted in **Table 3** would need to be reassessed at such a time.

Proposed Imp. Areas (6.813ha)	1 In 1 Year	1 In 30 Year	1 In 100 Year + 45% CC
Restricted Run-Off Rate	13.5l/s	13.5l/s	13.5l/s
Estimated Stormwater Storage Volume	1792cu.m-3747cu.m	3895cu.m-6925cu.m	9062cu.m-13675cu.m

Table 3: Estimated Stormwater Storage Requirements (Betts Hydro, 2022)

- 5.6.11 The surface water scheme for the development will need to be designed to cater for the surface water run-off generated in the events up to and including the 1 in 100yr return period event with 45% allowance for climate change. In terms of stormwater attenuation, it would be beneficial to implement SuDS features where at all practical, subject to ground investigation and a detailed levels review.
- 5.6.12 As already discussed, the current drainage strategy utilised a range on integrated SuDS features, including permeable surfacing, rainwater gardens, swales/basins to cater for both surface water conveyance and attenuation requirements. At present there are 7no. SuDS swales/basins proposed on the Site, these features have been considered further in terms of initial design work to ensure that they can provide the required attenuation for the proposals considering the Site-specific constraints.
- 5.6.13 The initial design (Technical Due Diligence work) has also considered additional design factors including adding an additional 10% for potential urban creep as per the requirements of Rochdale Borough Council's Lead Local Flood Authority and having a run-off coefficient of 1 to ensure the stormwater storage can sufficiently cater for the required attenuation in due course. Full detailed drainage design will still be required

in due course to confirm the full technical details, at such a time the stormwater storage requirements and SuDS proposals can also be refined to reflect subsequent changes.

5.7 Discharge to Public Sewer Network

- 5.7.1 UU sewer records have identified public surface water compatible sewers within the vicinity of the Site to the west however these are combined networks and not suitable for surface water run-off connections from Site given the drainage hierarchy (**Appendix C**). Should infiltration not be feasible then the surface water flows generated from the Proposed Development are proposed to discharge into the nearest watercourse or waterbody and not the existing sewer network.

5.8 Climate Change

- 5.8.1 There are indications that the climate in the UK is changing significantly, and it is widely believed that the nature of climate change will vary greatly by region. Current expert opinion indicates the likelihood that future climate change would produce more frequent, short duration and high intensity rainfall events with the addition of more frequent periods of long duration rainfall.
- 5.8.2 It is believed that the impact of climate change means there is likely to be a long-term increase in the average sea levels, with an expectation that sea levels will rise gradually. An increase in flood water levels means that future flooding events will occur more frequently and will have a greater impact.
- 5.8.3 In light of the future uncertainties, climate change should be accounted for within the design of all new developments. Climate change factors have been considered and any increase in the level of flood risk (to the Site) from climate change is likely to be related to the increase in rainfall intensity and duration and its impact upon the surface water drainage system.
- 5.8.4 In accordance with the updated climate change projections for the Irwell Management Catchment, the peak rainfall allowance estimated changes to rainfall intensity figures are noted in **Table 4**. Based on the design life of the Proposed Development, (100yrs) the "total potential change figures for the 2070's" have been utilised within this assessment. The surface water scheme for the development will therefore need to be designed to cater for the surface water run-off generated in the events up to and including the 1 in 100yr return period event with 45% allowance for climate change.

PROJECTIONS	TOTAL POTENTIAL CHANGE ANTICIPATED FOR THE 2070'S
UPPER END ESTIMATE	45%
CENTRAL CHANGE FACTOR	30%

Table 4: Change to Extreme Rainfall Intensity Compared to 1961-1990 Baseline (Environment Agency, 2016)

6.0 FOUL WATER MANAGEMENT

- 6.1 Review of the public sewer network records provided by United Utilities has identified multiple public sewers within the vicinity of the Site (refer to sewer records within **Appendix C**). There are public combined systems within Hollingworth Road to the east of the Site and multiple public combined and foul water systems located within the residential areas to the west of the Site.
- 6.2 Although the Site has a small area of existing development, this is domestic and the foul water flows generated here are no comparison to that which will be generated on the Site post-development. Currently there is no confirmation of where the existing foul water flows generated by the onsite dwelling discharge to and therefore for the purpose of this assessment, we have assumed that a new connection to serve the new development proposals will be required.
- 6.3 The proposals for the construction of approximately 312no. residential units and a Primary School. The approximate peak foul water flows generated by the residential dwellings proposed would equate to 14.4l/s. This is based on 4000 litres per dwelling per 24 hours; the guidance contained within *Sewers for Adoption* (SfA). In terms of flows generated by the primary school this will need to be calculated as per the guidance within *Sewers for Adoption* once the proposed scheme is finalised.
- 6.4 The proposals for foul water management at the Site are to discharge into the nearest foul water sewer compatible for a public sewer asset. The nearest sewer would be the public combined water sewer (225mm dia.) located within Hollingworth Road to the east of the Site, as illustrated in the Preliminary Drainage Layouts (found in **Figures 9** and **10** previously).
- 6.5 Full detailed design will be required to confirm the technical details however given the Site constraints; some initial technical due diligence work has been carried out to show feasibility of the approach discussed above. This initial design work confirms that gravity connection to the public sewer in Hollingworth Road can be achieved in terms of engineering requirements.
- 6.6 It is acknowledged that offsite work will be required to achieve connection to the public sewer network and any works outside of the client's ownership will need to be discussed and agreed with the relevant authority/third party. Furthermore, UU must consent to any proposed works to the public sewer network. Discussion with UU is recommended to ensure there will be sufficient capacity for a single connection to serve the Site into this public sewer asset. It is understood that initial discussions in the form of pre-development enquiry has previously been submitted to UU to agree the approach in principle.

7.0 SUMMARY AND CONCLUSIONS

- 7.1 This Flood Risk Assessment and Drainage Management Strategy was commissioned by Bloor Homes Northwest, referred to hereafter as 'the Applicant'. This report has been prepared to support a hybrid planning application for the construction of 312no. residential dwellings, a new Primary School and associated works on land off Hollingworth Road in Littleborough.
- 7.2 The total site covers 19.20 hectares and is located within Flood Zone 1 according to Environment Agency mapping. The proposals are mostly residential, in nature (except for the new primary school) and in accordance with Planning Practice Guidance, this mixed-use scheme should be considered as 'more vulnerable' within the Planning Practice Guidance which supports the National Planning Policy Framework. The Planning Practice Guidance confirms that 'more vulnerable' development is appropriate to be located within Flood Zone 1, providing there is no increase in flood risk elsewhere due to the proposals.

Flood Risk

- 7.3 This report has reviewed all sources of flood risk both to and resulting from the Proposed Development. Although there is a watercourse in proximity of the Proposed Development, as the existing topography falls towards the watercourse from the lowest Site boundary, the proposals are at very low flood risk from fluvial flood risk. The Rochdale Canal is located adjacent to the northern boundary of the Site. Consultations with The Canal & Rivers Trust (CRT) have confirmed that they are not aware of any breach events in the vicinity of the Proposed Development Site. As the existing onsite levels fall towards the canal and significantly away from the Proposed Development, the risk of flooding associated with canal is 'low'.
- 7.4 The Hollingworth Lake reservoir is located less than 100m to the south of Site and is elevated in comparison. The flood risk mapping shows that part of the Site would be susceptible to significant flooding should a failure occur in this nearby reservoir. Although reservoir flooding is highly unlikely, due to the strict maintenance and monitoring regimes implemented by the Environment Agency, as part of the Reservoirs Act 1975; if a failure was to occur there would be little or no warning and therefore preparedness is key to ensure resilience.
- 7.5 Initial enquiries and review of the key publications has not identified any historic issues at the site associated with this reservoir although to promote community preparedness it is advised that future residents prepare a household Flood Plan, detailing the important measures to take in the event of a future flood incident. Other mitigation measures with to safeguard the proposals against this residual risk have also been noted within this assessment.
- 7.6 Consultations with the Environment Agency, United Utilities, Rochdale Borough Council and the Canal & Rivers Trust have been undertaken and did not identify any historical incidents of flooding on the Site. The primary flood risk potential to the Proposed Development is therefore considered to be from surface water run-off; this risk varies across the Site and is closely associated with the existing topography. The risk associated with surface water flooding will be reduced and sustainably managed

post-development, following the implementation of mitigation measures proposed within this assessment.

Drainage Strategy

- 7.7 Due to the relatively low flood risks identified, the principal focus of this assessment is on the sustainable management of surface water run-off to ensure no increased surface water run-off results because of the Proposed Development, in accordance with national and local policy. The surface water discharge options have been assessed in accordance with the sustainable drainage hierarchy as published in the *Sustainable Drainage System (SuDS) Manual (CIRIA 753)*.
- 7.8 Given the presence of underlying coal measures in the sub geology and the areas mining history, an infiltration-based solution is not likely to be practical due to the high potential for leaching of contaminants from the underlying coal measures. Furthermore, given the mining history of the Site, there is potential for further engineering constraints to be present, restricting the location of soakaway features within the Site boundaries. This issue would be exacerbated due to the steep gradient across the Site.
- 7.9 Assuming infiltration will not be feasible based on the information reviewed, then in accordance with the drainage hierarchy the next method to be explored is to discharge surface water run-off to a watercourse. The nearest waterbody to the Site is the Rochdale Canal, located adjacent to the northern boundary. At present flows from most of the site would naturally convey towards this area and therefore the proposals would be to continue to do this via a formal connection (subject to relevant consents).
- 7.10 The canal is a private asset, and as such consent for works to this asset will be required from the asset owners. Early consultation with the Canal & Rivers Trust has been undertaken to ascertain ownership and terms for a potential new formal connection to the canal direct from the Proposed Development Site. A pre-development response from CRT has confirmed they would allow a connection into the canal at a restricted discharge rate. Technical Due Diligence work has been carried out to confirm the feasibility and deliverability the proposed new surface water outfall into to the adjacent canal, at the restricted discharge rate agreed with the Canal & Rivers Trust.
- 7.11 In accordance with the Sustainable Drainage System (SuDS) Manual (CIRIA 753) and the Non-Statutory Technical Standards for Sustainable Drainage Systems (Department for Environment, Food and Rural Affairs, March 2015) all sites should endeavour to achieve as close to pre-development greenfield rates as is viable. Based on the existing catchment area contributing to the canal at present, the pre-development greenfield rate (QBar) is calculated to be 13.5l/s using the Flood Estimation Handbook (FEH) Statistical Method.
- 7.12 The proposals are therefore to restrict the surface water run-off to mimic this pre-development greenfield situation as agreed with Canal & Rivers Trust. The restricted flow will generate a storage requirement during extreme storm events. It would be beneficial to implement SuDS features where at all feasible, subject to ground investigation and a detailed levels review.

- 7.13 If designed and located appropriately, the SuDS features such as a pond/basin could potentially aid in the attenuation requirements and provide added benefits in terms of water quality improvements. Technical Due Diligence work has been completed and confirmed that SuDS in the form of permeable surfacing, rainwater gardens, swales/basins can be incorporated into the proposals to assist with the onsite stormwater conveyance and attenuation requirements.
- 7.14 This assessment has been prepared in consultation with the relevant interested parties and is commensurate with the scale and nature of the development proposals. To summarise, the development can be considered appropriate in accordance with the National Planning Policy Framework, Planning Practice Guidance and other flood risk and drainage related standards.

8.0 RECOMMENDATIONS

- 8.1 For 'more vulnerable' development located within Flood Zone 1, it is typical to set the FFLs of residential dwellings typically to a minimum of 150mm above the existing ground levels. As some areas of the Site are shown to have had a high susceptibility to other sources of flooding (surface water and reservoir), it may be beneficial to increase the FFL freeboard to 300mm in areas of high surface water flood risk and up to 600mm in areas at risk of high risk of reservoir flooding to offer additional resilience. It would be down to the LLFA to confirm their specific requirements in this case.
- 8.2 Additionally, for future residents to be prepared, each property should be made aware of the potential residual flood risk associated with reservoir flooding. It is advised that any future residents and the school management authority prepare specific Flood Plans, detailing the procedures and important measures to take in the event of a flood incident which could potentially impact the Site.
- 8.3 By keeping the finished floor levels elevated relative to the externals, this should help create an overland flood flow route in the event of a breach or any other source of flooding that could lead to overland flow.
- 8.4 UU have confirmed that they will require a 5-6m easement from the centreline of the LDTM Raw Water Main Sewer line which crosses through the eastern part of the Site from the reservoir into Rochdale Canal.
- 8.5 To minimise the flood risk to the neighbouring properties it is recommended that the surface water run-off generated by the Proposed Development be managed effectively with the peak rates of run-off being restricted to the equivalent of the pre-development situation (with betterment where required).
- 8.6 The proposed onsite surface water drainage system will need to be sized to contain the 1 in 30yr return period event below ground with exceedance from storm events up to and including the 1 in 100yr return period storm event with a 45% allowance for climate change being contained onsite.
- 8.7 Detailed design will be required to confirm the technical details of the drainage strategy proposed within this assessment. Formal consents for proposed outfalls and works outside of land ownership will be required to be obtained in due course and early discussion is advised where at all possible.
- 8.8 It is important that should any drainage systems not be offered for adoption to either UU or RBC then an appropriate maintenance regime should be scheduled with a suitably qualified management company for these private drainage systems.
- 8.9 If an extreme rainfall event exceeds the design criteria for the drainage system it is likely that there will be some overland flows that are unable to enter the system. It is important that these potential overland flows are catered for within the Site if the capacity of the drainage system is exceeded.

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CIRIA – <http://www.ciria.org/>
Cranfield University – <http://www.landis.org.uk/soilscapes/>
Environment Agency – www.environment-agency.gov.uk/
FloodProBE – <http://www.floodprobe.eu/>
Flood Forum – <http://www.floodforum.org.uk/>
Google Maps – <http://maps.google.co.uk/>
Rainfall Climate Change Allowance - <https://environment.data.gov.uk/hydrology/climate-change-allowances/rainfall>
Streetmap – <http://www.streetmap.co.uk/>
United Utilities – <https://www.unitedutilities.com/>

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APPENDIX A: NPPF & PPG EXTRACTS

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14. Meeting the challenge of climate change, flooding and coastal change

157. The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.

Planning for climate change

158. Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures⁵⁶. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure.
159. New development should be planned for in ways that:
- a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and
 - b) can help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards.
160. To help increase the use and supply of renewable and low carbon energy and heat, plans should:
- a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, and their future re-powering and life extension, while ensuring that adverse impacts are addressed appropriately (including cumulative landscape and visual impacts);
 - b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and

⁵⁶ In line with the objectives and provisions of the Climate Change Act 2008.

- c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.
161. Local planning authorities should support community-led initiatives for renewable and low carbon energy, including developments outside areas identified in local plans or other strategic policies that are being taken forward through neighbourhood planning.
162. In determining planning applications, local planning authorities should expect new development to:
- a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and
 - b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.
163. When determining planning applications⁵⁷ for renewable and low carbon development, local planning authorities should:
- a) not require applicants to demonstrate the overall need for renewable or low carbon energy, and recognise that even small-scale projects provide a valuable contribution to significant cutting greenhouse gas emissions;
 - b) approve the application if its impacts are (or can be made) acceptable⁵⁸. Once suitable areas for renewable and low carbon energy have been identified in plans, local planning authorities should expect subsequent applications for commercial scale projects outside these areas to demonstrate that the proposed location meets the criteria used in identifying suitable areas; and
 - c) in the case of applications for the repowering and life-extension of existing renewable sites, give significant weight to the benefits of utilising an established site, and approve the proposal if its impacts are or can be made acceptable.
164. In determining planning applications, local planning authorities should give significant weight to the need to support energy efficiency and low carbon heating improvements to existing buildings, both domestic and non-domestic (including

⁵⁷ Wind energy development involving one or more turbines can also be permitted through Local Development Orders, Neighbourhood Development Orders and Community Right to Build Orders. In the case of Local Development Orders, it should be demonstrated that the planning impacts identified by the affected local community have been appropriately addressed and the proposal has community support.

⁵⁸ Except for applications for the repowering and life-extension of existing wind turbines, a planning application for wind energy development involving one or more turbines should not be considered acceptable unless it is in an area identified as suitable for wind energy development in the development plan or a supplementary planning document; and, following consultation, it can be demonstrated that the planning impacts identified by the affected local community have been appropriately addressed and the proposal has community support.

through installation of heat pumps and solar panels where these do not already benefit from permitted development rights). Where the proposals would affect conservation areas, listed buildings or other relevant designated heritage assets, local planning authorities should also apply the policies set out in chapter 16 of this Framework.

Planning and flood risk

165. Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.
166. Strategic policies should be informed by a strategic flood risk assessment, and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards.
167. All plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:
 - a) applying the sequential test and then, if necessary, the exception test as set out below;
 - b) safeguarding land from development that is required, or likely to be required, for current or future flood management;
 - c) using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding, (making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management); and
 - d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.
168. The aim of the sequential test is to steer new development to areas with the lowest risk of flooding from any source. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying this test. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding.
169. If it is not possible for development to be located in areas with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the site and of the development proposed, in line with the Flood Risk Vulnerability Classification set out in Annex 3.

170. The application of the exception test should be informed by a strategic or site-specific flood risk assessment, depending on whether it is being applied during plan production or at the application stage. To pass the exception test it should be demonstrated that:
- a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and
 - b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.
171. Both elements of the exception test should be satisfied for development to be allocated or permitted.
172. Where planning applications come forward on sites allocated in the development plan through the sequential test, applicants need not apply the sequential test again. However, the exception test may need to be reapplied if relevant aspects of the proposal had not been considered when the test was applied at the plan-making stage, or if more recent information about existing or potential flood risk should be taken into account.
173. When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment⁵⁹. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:
- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
 - b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;
 - c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
 - d) any residual risk can be safely managed; and
 - e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

⁵⁹ A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

174. Applications for some minor development and changes of use⁶⁰ should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments set out in footnote 59.
175. Major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should:
- a) take account of advice from the lead local flood authority;
 - b) have appropriate proposed minimum operational standards;
 - c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and
 - d) where possible, provide multifunctional benefits.

Coastal change

176. In coastal areas, planning policies and decisions should take account of the UK Marine Policy Statement and marine plans. Integrated Coastal Zone Management should be pursued across local authority and land/sea boundaries, to ensure effective alignment of the terrestrial and marine planning regimes.
177. Plans should reduce risk from coastal change by avoiding inappropriate development in vulnerable areas and not exacerbating the impacts of physical changes to the coast. They should identify as a Coastal Change Management Area any area likely to be affected by physical changes to the coast, and:
- a) be clear as to what development will be appropriate in such areas and in what circumstances; and
 - b) make provision for development and infrastructure that needs to be relocated away from Coastal Change Management Areas.
178. Development in a Coastal Change Management Area will be appropriate only where it is demonstrated that:
- a) it will be safe over its planned lifetime and not have an unacceptable impact on coastal change;
 - b) the character of the coast including designations is not compromised;
 - c) the development provides wider sustainability benefits; and
 - d) the development does not hinder the creation and maintenance of a continuous signed and managed route around the coast⁶¹.

⁶⁰ This includes householder development, small non-residential extensions (with a footprint of less than 250m²) and changes of use; except for changes of use to a caravan, camping or chalet site, or to a mobile home or park home site, where the sequential and exception tests should be applied as appropriate.

⁶¹ As required by the Marine and Coastal Access Act 2009.

179. Local planning authorities should limit the planned lifetime of development in a Coastal Change Management Area through temporary permission and restoration conditions, where this is necessary to reduce a potentially unacceptable level of future risk to people and the development.

(<http://www.legislation.gov.uk/ukxi/2015/596/article/4/made>) to require planning permission to be sought in each case.

Paragraph: 075 Reference ID: 7-075-20220825

Revision date: 25 08 2022

How can neighbourhood plans and neighbourhood development/community right to build orders take account of coastal change?

In any instance where a Neighbourhood Area is proposed in a Coastal Change Management Area, careful attention should be paid to the guidance on [what development would be appropriate in such an area](#), including whether [time-limiting planning permissions](#) are needed. The local planning authority will need to be consulted about existing and anticipated levels of risk, and the types of development that may or may not be appropriate.

See related policy in [paragraphs 170 to 173 of the National Planning Policy Framework](#) (<https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change>).

Paragraph: 076 Reference ID: 7-076-20220825

Revision date: 25 08 2022

Flood Zone and flood risk tables

- Table 1: Flood Zones
- [National Planning Policy Framework Annex 3 - Flood risk vulnerability classification](#) (<https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification>)
- [Table 2: Flood risk vulnerability and flood zone 'incompatibility'](#)

Paragraph: 077 Reference ID: 7-077-20220825

Revision date: 25 08 2022

Table 1: Flood Zones

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 0.1% annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map for Planning – all land outside Zones 2, 3a and 3b)
Zone 2 Medium Probability	Land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual

Flood Zone	Definition
	probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1% or greater annual probability of river flooding; or Land having a 0.5% or greater annual probability of sea. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: • land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or • land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](https://www.gov.uk/guidance/local-planning-authorities-strategic-flood-risk-assessment) (<https://www.gov.uk/guidance/local-planning-authorities-strategic-flood-risk-assessment>) when considering location and potential future flood risks to developments and land uses.

Paragraph: 078 Reference ID: 7-078-20220825

Revision date: 25 08 2022

Table 2: Flood risk vulnerability and flood zone 'incompatibility'

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

Key:

✓ Exception test is not required

X Development should not be permitted

Notes to table 2:

- This table does not show the application of the [Sequential Test](#) which should be applied first to guide development to the lowest flood risk areas; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and [Exception Tests](#) do not need to be applied to those developments set out in [National Planning Policy Framework footnote 56](#) (<https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change>). The Sequential and Exception Tests should be applied to 'major' and 'non major' development;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

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

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

- remain operational and safe for users in times of flood;

- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

Paragraph: 079 Reference ID: 7-079-20220825

Revision date: 25 08 2022

Site-specific flood risk assessment: Checklist

1 - Development site and location

You can use this section to describe the site you are proposing to develop. It would be helpful to include, or make reference to, a location map which clearly indicates the development site.

- a. Where is the development site located? (e.g. postal address or national grid reference)
- b. What is the current use of the site? (e.g. undeveloped land, housing, shops, offices)
- c. Which Flood Zone (for river or sea flooding) is the site within? (i.e. Flood Zone 1, Flood Zone 2, Flood Zone 3). As a first step, you should check the [Flood Map for Planning \(https://flood-map-for-planning.service.gov.uk/\)](https://flood-map-for-planning.service.gov.uk/). Check the Strategic Flood Risk Assessment for the area available from the local planning authority to identify if the site is within Flood Zone 1 but at increased risk of flooding in future due to climate change
- d. Also check the Strategic Flood Risk Assessment to identify if there are any other sources of flooding that may affect the site now or in the future.

2 - Development proposals

You can use this section to provide a general summary of the development proposals. It would be helpful to include, or make reference to, an existing block plan and a proposed block plan, where appropriate.

- a. What are the development proposal(s) for this site? Will this involve a change of use of the site and, if so, what will that change be?
- b. In terms of vulnerability to flooding, what is the vulnerability classification of the proposed development? See [National Planning Policy Framework Annex 3 \(https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification\)](https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification) for an explanation of the vulnerability classifications.
- c. What is the expected or estimated lifetime of the proposed development likely to be (e.g. 100 years or 75 years)? See [paragraph 006](#) of this guidance for further advice on how to assess the lifetime of developments for flood risk and coastal

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APPENDIX B: EA INFORMATION & CORRESPONDENCE

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Megan Berry

From: Megan Berry
Sent: 05 August 2022 15:44
To: 'GMMC Info Requests'
Subject: FW: Flood Risk Information - Product 4
Attachments: LOCATION PLAN.pdf

To whom it may concern,

Hollingworth Road, Littleborough.

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the site above (see location plan attached), including details of historical flooding, predicted flood water levels and current drainage issues (Product 4); this would be greatly appreciated.

It is understood that the site is located within Flood Zone 1 but is surrounded by a canal, main river and a reservoir. The site is shown on the online mapping to be at risk from reservoir flooding, we are therefore seeking further information regarding the risk and what would be required when coming to prepare a full FRA in the near future and what would the EA require to be included?

If there are any other specific requirements that you require in a scope of works for this site please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

BETTS HYDRO

Engineering Consultants

Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY

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Megan Berry

From: GMMC Info Requests <Inforequests.gmmc@environment-agency.gov.uk>
Sent: 20 December 2018 09:44
To: Megan Berry
Subject: GMMC110642AB Response attached from the Environment Agency
Attachments: GMMC110642AB_DFM.PDF; GMMC110642AB_Res.pdf; GMMC110642AB_table_P4.pdf; Reservoir Flood Map Attachment.pdf; CCA - Area External Guidance v5.pdf

Dear Megan,

Thank you for your enquiry which was received on 18/12/18.

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

I enclose the data requested. We have no record of flooding affecting this 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 Rochdale Metropolitan District Authority who may hold additional information (the former especially in relation to sewer flooding).

There are no flood defences within the vicinity of the site.

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/>

Please also note that all current EA flood risk strategy documents can be found on our external website <https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities> and <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,

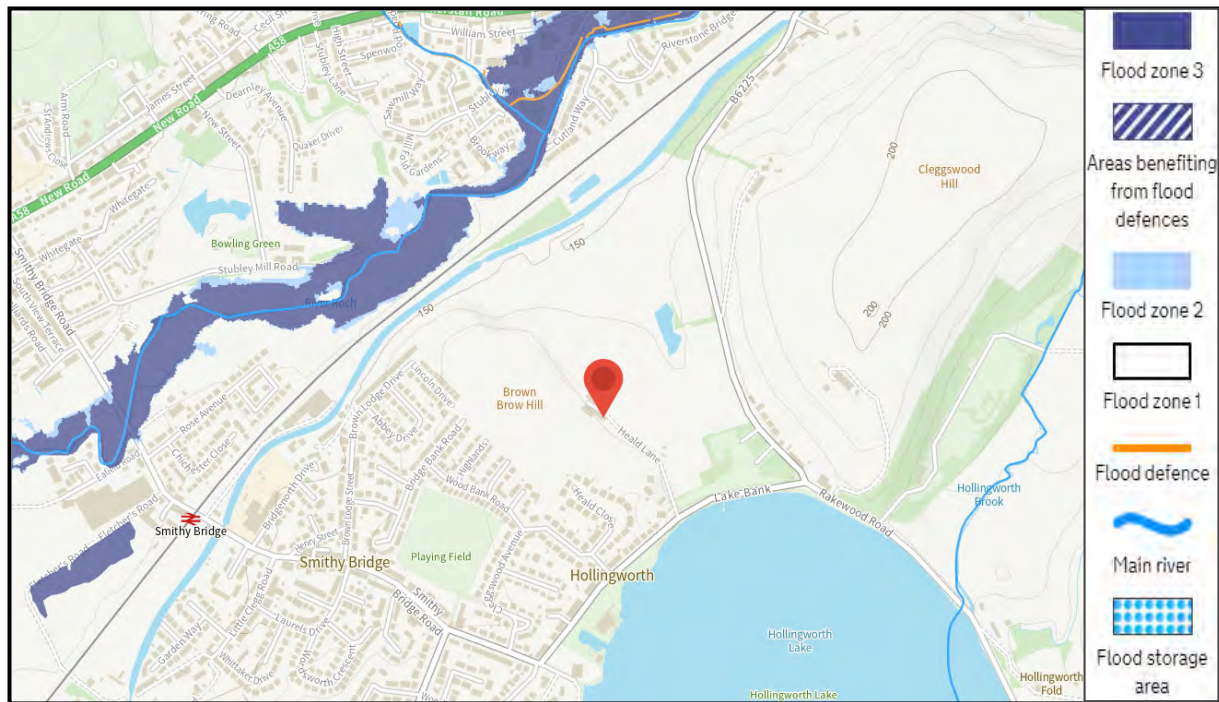
Anne Ball
Customer and Engagement Officer
Greater Manchester, Merseyside and Cheshire
External: 020 302 51232
Mobile: 07769285094
Email: Inforequests.gmmc@environment-agency.gov.uk

Information in this message may be confidential and may be legally privileged. If you have received this message by mistake, please notify the sender immediately, delete it and do not copy it to anyone else.

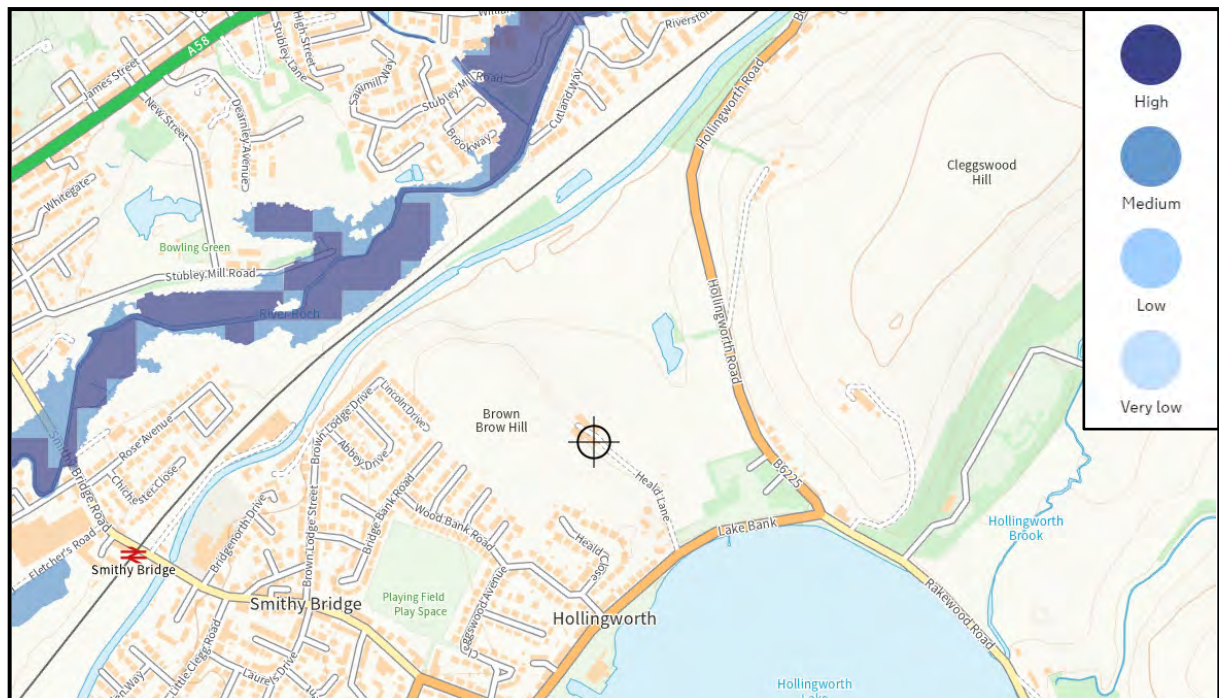
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NATIONAL FLOOD MAPPING

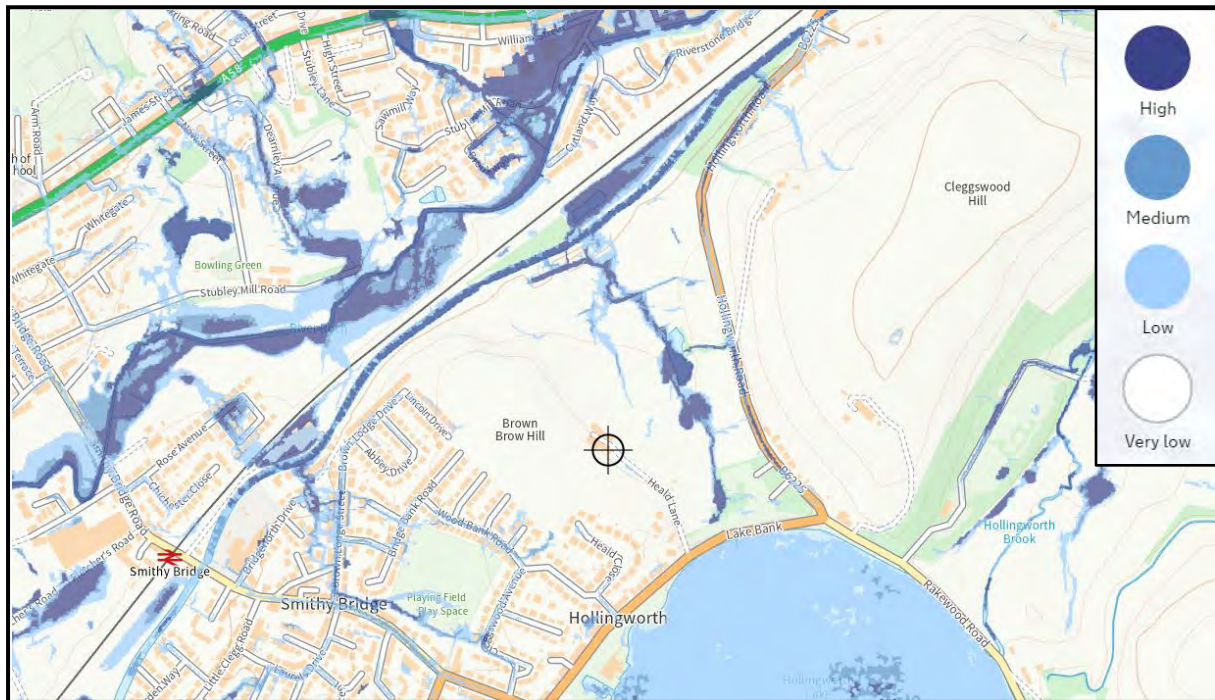
Flood Map for Planning



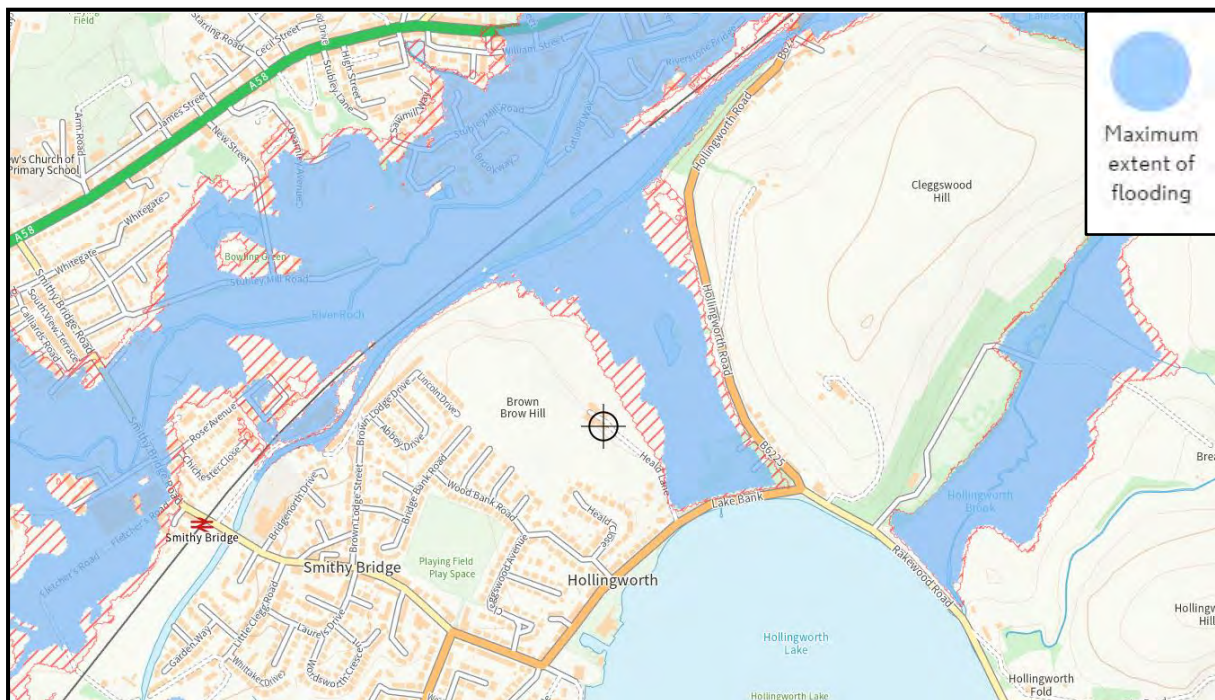
Long Term Flood Risk – Rivers or Sea



Long Term Flood Risk – Surface Water



Long Term Flood Risk - Reservoirs



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APPENDIX C: UU RECORDS & CORRESPONDENCE

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Megan Berry

From: O'Brien, Neil <Neil.O'Brien@uuplc.co.uk>
Sent: 07 May 2019 15:48
To: Megan Berry; Wastewater Developer Services
Subject: REPEAT3: Customer repeat 180419

Follow Up Flag: Follow up
Flag Status: Flagged

Megan,

From a wastewater point of view the feeder pipe would be consider a 'watercourse' and with any watercourse you would need the consent of the owner of that watercourse. In this case it is UU clean water. It seems that it is unlikely that UU clean water would give such consent but this will be confirmed shortly.

Regards

Neil

From: Megan Berry [mailto:meganberry@betts-associates.co.uk]
Sent: 18 April 2019 15:49
To: O'Brien, Neil <Neil.O'Brien@uuplc.co.uk>; Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Cc: Dodd, Matthew <Matthew.Dodd@uuplc.co.uk>; Mooney, Eugene <eugene.mooney@uuplc.co.uk>
Subject: Customer repeat 180419

Hi Neil,

Thank you for your quick response. As this is a controlled feeder pipe would we be able to connect into this network at a restricted rate?

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

BETTS HYDRO
Consulting Engineers

Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY
Chester +44 (0)1244 289041

meganberry@betts-associates.co.uk
www.betts-associates.co.uk

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From: O'Brien, Neil
Sent: 18 April 2019 14:44
To: Megan Berry ; Wastewater Developer Services
Cc: Dodd, Matthew ; Mooney, Eugene
Subject: RE: REPEAT 2a: UU Pre-Development Enquiry - Hollingworth Road, Littleborough - 4200025137

Megan,

The easement is '9 foot'. The feeder pipe is a UU asset. UU are obligated to provide the canal with an average of 8.52 MI/d and no more than 12.17 MI/d on any given day from 1 November to 30 April and an average of 8.52 MI/d and no more than 19.48 MI/d on any given day from 1 May to 31 October under the Oldham and Rochdale Corporations Water Act (1923). Flow to the canal is controlled from the lake bank valve tower which has a 2 level draw off system (Top and Bottom). Water is passed through a 300mm pipe through the embankment to a flow meter house on the downstream face where quantities discharged are recorded, from there water flows into a box section stone culvert under fields and the Akzo Nobel Chemical works to the canal.

British Water Ways and Rochdale Council were aware of 'United Utilities feeder culvert' in 2012. If you can find drawing SKL245:PL01 submitted with planning application No: 11/D55085

Sursrvde#Uhvlgqwd#ghyhrs p hq#0# : 7#gzhqjv##
Orfdwlrq#Irup hu#Dn}r#Q reh#Vln/#K roqjvz ruk#Urdg/#Dlwheurxjk/#Urfkgdd#
Z dwuz d|#Urfkgdd#F dqdd#

The feeder pipe is located mainly under the estate road.

Regards

Neil

From: Megan Berry [<mailto:meganberry@betts-associates.co.uk>]
Sent: 18 April 2019 09:05
To: O'Brien, Neil ; Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Cc: Dodd, Matthew <Matthew.Dodd@uuplc.co.uk>; Mooney, Eugene <eugene.mooney@uuplc.co.uk>
Subject: RE: REPEAT 1: UU Pre-Development Enquiry - Hollingworth Road, Littleborough - 4200025137

Hi Neil,

Thank you for your response.

Please can you confirm the size of the easement for the feeder pipe? As on the plan you originally sent over the purple line (the easement) does not line up with the green dotted line (feeder pipe)?

If it once belonged to the Rochdale Canal Company would it not have been taken over by CRT? As in correspondence they have not confirmed or aware of this assets, neither are the council.

Eugene,

Please can you confirm what is a DPA? And if there are two pipes within this location feeding the canal?

A quick response would be very appreciated

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

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From: O'Brien, Neil
Sent: 11 April 2019 16:24
To: Megan Berry <meganberry@betts-associates.co.uk>; Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Cc: Dodd, Matthew <Matthew.Dodd@uuplc.co.uk>; Mooney, Eugene <eugene.mooney@uuplc.co.uk>
Subject: REPEAT 1: UU Pre-Development Enquiry - Hollingworth Road, Littleborough - 4200025137

Megan,

It seems Hollingworth Lake was 'transferred' to UU back in the 70's and there is a feeder pipe from the lake to the canal. I am not sure if this pipe transferred to UU. The easement is for the this feeder pipe. The easement grantee was the Rochdale Canal Company so I am not sure if the easement has been transferred to UU.

The orange and pink lines are DPA boundary lines – something to do with clean water.

Eugene,

What is a DPA?

Please could you provide Megan with some information about Hollingworth Lake. Is the green broken line shown below the canal feeder pipe or a pressurized pipe?

Regards

Neil

From: Megan Berry [<mailto:meganberry@betts-associates.co.uk>]

Sent: 11 April 2019 15:26

To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>; O'Brien, Neil

Cc: Dodd, Matthew <Matthew.Dodd@uuplc.co.uk>

Subject: RE: UU Pre-Development Enquiry - Hollingworth Road, Littleborough - 4200025137

Hi Neil,

Please can you respond to my email ASAP the client is keen to gain clarification, or if it is easier please ring me on the number below.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

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From: Megan Berry
Sent: 08 April 2019 09:00
To: 'Wastewater Developer Services' <WastewaterDeveloperServices@uuplc.co.uk>; O'Brien, Neil
Cc: 'Dodd, Matthew' <Matthew.Dodd@uuplc.co.uk>
Subject: RE: UU Pre-Development Enquiry - Hollingworth Road, Littleborough - 4200025137

Good Morning Neil,

Thank you for your email, it was understood through previous correspondence (see attached) that the pipe crossing the site is a pressurized raw water distribution main owned by UU. Please can you confirm?

Furthermore, please can you confirm what the easement crossing site, shown by the purple line, is for? As we have no records of a pipe being located within this area. Also please can you confirm what the blue and orange lines stand for on the snippet you sent over?

It would be greatly appreciated if you could clarify these either by email or over the phone as soon as possible.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

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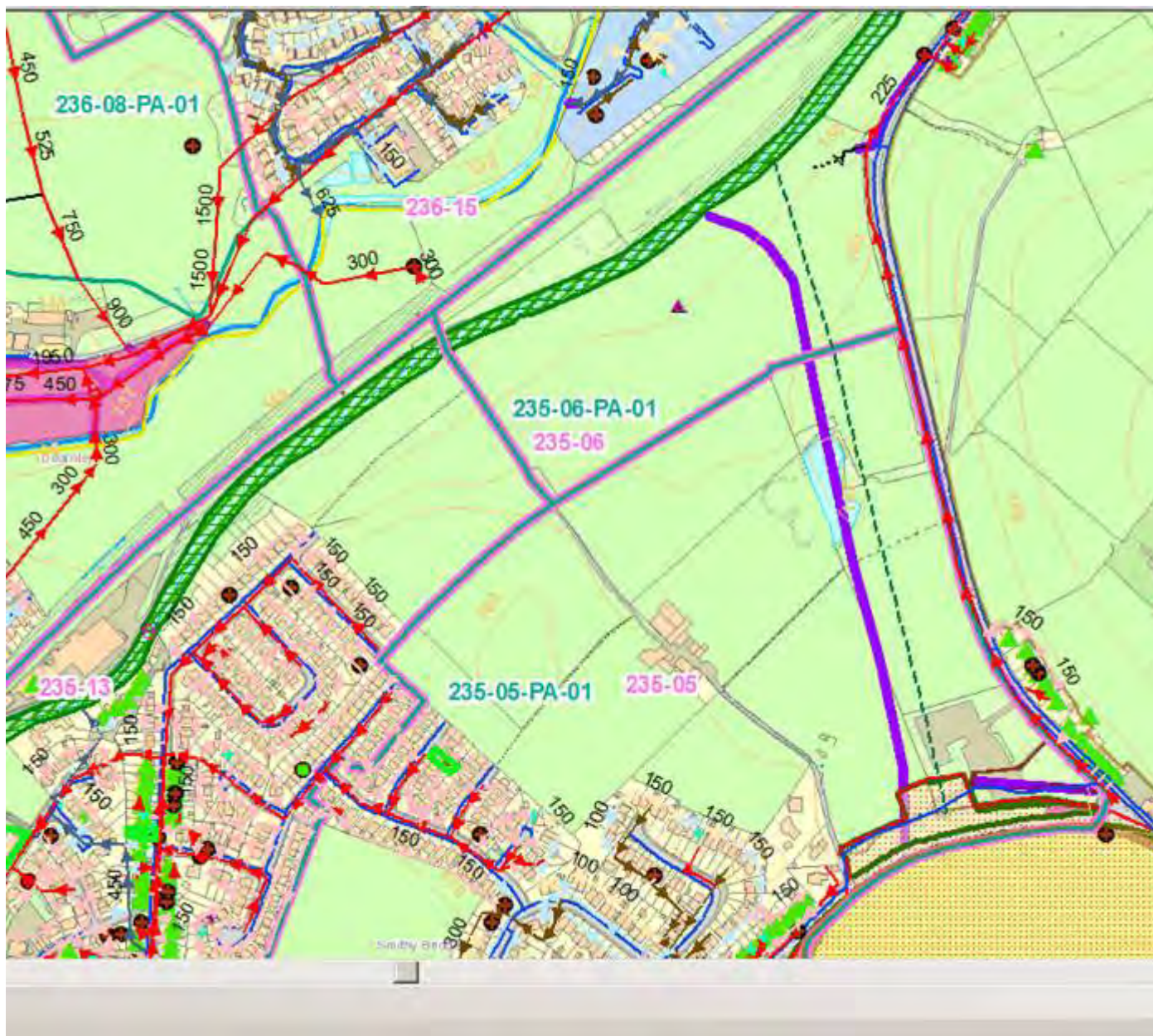
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From: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Sent: 05 April 2019 14:05
To: Megan Berry <meganberry@betts-associates.co.uk>; Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Subject: RE: UU Pre-Development Enquiry - Hollingworth Road, Littleborough - 4200025137

Megan,



From: Megan Berry [<mailto:meganberry@betts-associates.co.uk>]

Sent: 22 March 2019 09:33

To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>

Subject: UU Pre-Development Enquiry - Hollingworth Road, Littleborough

UU PREDEVELOPMENT ENQUIRY. Pro-forma attached.

To Whom It May Concern,

We are currently preparing a Flood Risk Management Assessment and Drainage Management Strategy to support a residential planning application on land off Hollingworth Road in Littleborough. As part of the preparation, a drainage management strategy has been devised and at this stage we are seeking to begin discussions with UU with regards to the proposed surface water and foul water: attached is the pre-application advice form with supporting information as required.

Surface Water:

Surface water discharge options have been assessed in accordance with the sustainable drainage hierarchy. Given the presence of underlying coal measures in the sub geology and the areas mining history, an infiltration-based solution is not likely to be practical due to the high potential for leaching of contaminants from the underlying coal

measures. Furthermore, given the mining history there is potential for further engineering constraints to be present onsite, restricting the location of Soakaway features within the site boundaries. This issue would be exacerbated due to the steep gradient across the site. The adjacent site has planning permission (11/D55085) which furthermore supports that infiltration is unlikely to be practical on this site.

Assuming infiltration will not be feasible based on the information reviewed, then in accordance with the drainage hierarchy the next method to be explored is to discharge surface water run-off to a watercourse. The nearest watercourse to site is the River Roch (Main River) located approximately 450m to the north of site beyond the canal and railway. Given the engineering constraints associated with routing to the Main River it is unlikely that a direct discharge from site to the River Roch will be achievable. The Rochdale Canal and Rochdale Railway Line form the two primary constraints to achieve this direct connection, routing would need to span across 450m beneath a canal structure and railway line. Due to these constraints we have considered the potential alternatives.

Given that infiltration and a connection into the River Roch is unlikely to offer a surface water management solution for the site, it is proposed that the development mimics the existing regime and continues to discharge into the canal. The Rochdale Canal is located adjacent to the northern boundary of site and as previously discussed it is understood that the site naturally drains via overland run-off into the canal. It is therefore proposed the development site mimics the existing situation and discharges at the restricted pre-development greenfield rate. However, as the Canals and Rivers Trust are not a statutory drainage authority, they are not obliged to accept discharges into their network. Pre-development discussion with the CRT are currently being undertaken however a response is proving difficult to obtain.

If a new formal outfall into the Rochdale Canal cannot be agreed, then the alternative would be to consider discharging into the public combined sewer network (225mm dia.) within Hollingworth Road to the east of site. It is not clear whether this existing pipe length has sufficient capacity to cater for the flows discharging from the development. Detailed design will confirm the exact point of outfall location and whether a full gravity solution is feasible (not assumed to be feasible due to existing situation). Any new proposed point of connection will be agreed with United Utilities. In accordance with the SuDS Manual (CIRIA) and the Non-Technical Standards for SuDS (March 2015) all sites should endeavour to achieve as close to pre-development greenfield rates as is viable. The proposals are therefore to discharge to the public combined sewer at the restricted pre-development greenfield rate of 114.0l/s (QBar). This rate of discharge will be reviewed during detailed design stage when existing drainage systems have been investigated and updated accordingly if required.

Foul Water:

Review of the UU sewer records identify there to be public sewer infrastructure in proximity to the site. The development site is undeveloped at present and therefore, there are no onsite foul water flows currently generated thus no existing foul water connections present. The proposals for foul water management at the site are to discharge into the nearest foul water sewer compatible for a public sewer asset. The nearest sewer would be the public combined water sewer (225mm dia.) located within Hollingworth Road to the east of site. Early discussions with UU are recommended to ensure there will be sufficient capacity. Furthermore, UU must consent to any proposed works to the public sewer network. Based on the proposals for the construction of approximately 200no. units collectively the approximate peak foul water flows generated by the site overall is 9.2l/s. This is based on 4000 litres per dwelling per 24 hours; the guidance contained within Sewers for Adoption (SfA).

We are ultimately seeking to identify United Utilities preferred point of connection and to confirm any constraints. It is acknowledged that offsite work will likely be required to achieve connection into the public sewer network. Hopefully the summary above and the attached are of assistance and allow agreement in principle to be given, do not hesitate to contact me on the details below should you require any further assistance.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

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Consulting Engineers

Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY
Chester +44 (0)1244 289041

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Megan Berry

From: Dodd, Matthew <Matthew.Dodd@uuplc.co.uk>
Sent: 03 January 2019 11:31
To: Megan Berry
Cc: Wastewater Developer Services
Subject: RE: UU Historical Sewer Flooding - UU Ref 4200023559

Good Afternoon

I can confirm that we do have a current record of sewer flooding on our DG5 register within the vicinity of the proposed development. The DG5 register is a register of properties that have flooded as a result of hydraulic inadequacy of the public sewer network.

Please note that United Utilities Water Limited (UW) can only record and check flooding events which are reported to us and we have to comply with our Regulators instructions on the qualification of flooding events to place on the register.

Our response does not include:

- any sewer flooding events caused by blockages or collapses which are the result of third party actions, natural events or other actions over which UW has no control and not a facet of sewer capacity; or
- any historical sewer flooding events that have been removed from the register as a result of investment in our infrastructure.

As with all development sites, we recommend you liaise with our water and wastewater engineers by contacting our Developer Services team so the details of your development proposal can be considered further. Details can be found at the following link.

<https://www.unitedutilities.com/services/builders-developers/>

Should you require any further information please do not hesitate to contact me.'

Kind regards

Matthew Dodd
Assistant Developer Engineer
Developer Services and Planning
Network Delivery
United Utilities
T: 01925 679369 (internal 79369)
[unitedutilities.com](https://www.unitedutilities.com)

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From: Megan Berry [mailto:meganberry@betts-associates.co.uk]
Sent: 17 December 2018 17:33
To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Subject: UU Historical Sewer Flooding

F.A.O Flood Risk, Drainage and/or Planning department

Please forward to the correct department/ office

Good Afternoon Stephen,

Hollingworth Road, Littleborough.

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the site above (see location plan attached), including details of historical flooding, predicted flood water levels and current drainage issues; this would be greatly appreciated. If there are any other specific requirements that you require in a scope of works for this site please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

BETTS HYDRO
Engineering Consultants
Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY

CHESTER - 01244 289041

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Megan Berry

From: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Sent: 28 May 2019 14:55
To: Megan Berry; Wastewater Developer Services
Subject: REPEAT 3: Customer repeat 13 05 19 4200025137

Megan,

UU would have no objection to the connection of the foul flows from your proposed development to the combined sewer in Brown Lodge Drive.

Regards

Neil

From: Megan Berry [mailto:meganberry@betts-associates.co.uk]
Sent: 13 May 2019 16:11
To: O'Brien, Neil <Neil.O'Brien@uuplc.co.uk>; Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Subject: Customer repeat 13 05 19 4200025137

Good Afternoon Neil,

Sorry to keep emailing you regarding this site at Hollingworth road in Littleborough, it is understood that UU would allow the "Foul to drain to the public combined sewer located within Hollingworth Road at an unrestricted rate. The connection(s) to the public sewer can be at a point(s) convenient to yourself", however to prevent the construction of 2 pumping stations onsite we are now seeking an agreement in principle for the connection into the public combined sewer (MH.0401 - 150mm dia.) within Brown Lodge Drive via a gravity connection (see drainage plan attached). This connection would only cater for approximately 140 dwellings therefore collectively the approximate peak foul water flows generated by these dwellings overall is 6.4l/s. This is based on 4000 litres per dwelling per 24 hours; the guidance contained within Sewers for Adoption (SfA).

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

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From: O'Brien, Neil
Sent: 07 May 2019 15:48
To: Megan Berry ; Wastewater Developer Services
Subject: REPEAT3: Customer repeat 180419

Megan,

From a wastewater point of view the feeder pipe would be consider a 'watercourse' and with any watercourse you would need the consent of the owner of that watercourse. In this case it is UU clean water. It seems that it is unlikely that UU clean water would give such consent but this will be confirmed shortly.

Regards

Neil

From: Megan Berry [<mailto:meganberry@betts-associates.co.uk>]
Sent: 18 April 2019 15:49
To: O'Brien, Neil ; Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Cc: Dodd, Matthew <Matthew.Dodd@uuplc.co.uk>; Mooney, Eugene <eugene.mooney@uuplc.co.uk>
Subject: Customer repeat 180419

Hi Neil,

Thank you for your quick response. As this is a controlled feeder pipe would we be able to connect into this network at a restricted rate?

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

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From: O'Brien, Neil
Sent: 18 April 2019 14:44
To: Megan Berry ; Wastewater Developer Services
Cc: Dodd, Matthew ; Mooney, Eugene
Subject: RE: REPEAT 2a: UU Pre-Development Enquiry - Hollingworth Road, Littleborough - 4200025137

Megan,

The easement is '9 foot'. The feeder pipe is a UU asset. UU are obligated to provide the canal with an average of 8.52 MI/d and no more than 12.17 MI/d on any given day from 1 November to 30 April and an average of 8.52 MI/d and no more than 19.48 MI/d on any given day from 1 May to 31 October under the Oldham and Rochdale Corporations Water Act (1923). Flow to the canal is controlled from the lake bank valve tower which has a 2 level draw off system (Top and Bottom). Water is passed through a 300mm pipe through the embankment to a flow meter house on the downstream face where quantities discharged are recorded, from there water flows into a box section stone culvert under fields and the Akzo Nobel Chemical works to the canal.

British Water Ways and Rochdale Council were aware of 'United Utilities feeder culvert' in 2012. If you can find drawing SKL245:PL01 submitted with planning application No: 11/D55085

Sursrvde#Uhvlg hqldcghy hcrsp hqwd# : 7#bz hokjv##
Orfdwlrq#Irup hu#Dn}r#Qrehd#Vh/#K roqjvz ruk#Urdg/#Dlwcherurxjk/#Urfkgddn#
Z dwhuz d|#Urfkgddn#F dqqd#

The feeder pipe is located mainly under the estate road.

Regards

Neil

From: Megan Berry [<mailto:meganberry@betts-associates.co.uk>]
Sent: 18 April 2019 09:05
To: O'Brien, Neil ; Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Cc: Dodd, Matthew <Matthew.Dodd@uuplc.co.uk>; Mooney, Eugene <eugene.mooney@uuplc.co.uk>
Subject: RE: REPEAT 1: UU Pre-Development Enquiry - Hollingworth Road, Littleborough - 4200025137

Hi Neil,

Thank you for your response.

Please can you confirm the size of the easement for the feeder pipe? As on the plan you originally sent over the purple line (the easement) does not line up with the green dotted line (feeder pipe)?

If it once belonged to the Rochdale Canal Company would it not have been taken over by CRT? As in correspondence they have not confirmed or aware of this assets, neither are the council.

Eugene,

Please can you confirm what is a DPA? And if there are two pipes within this location feeding the canal?

A quick response would be very appreciated

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

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From: O'Brien, Neil

Sent: 11 April 2019 16:24

To: Megan Berry <meganberry@betts-associates.co.uk>; Wastewater Developer Services
<WastewaterDeveloperServices@uuplc.co.uk>

Cc: Dodd, Matthew <Matthew.Dodd@uuplc.co.uk>; Mooney, Eugene <eugene.mooney@uuplc.co.uk>

Subject: REPEAT 1: UU Pre-Development Enquiry - Hollingworth Road, Littleborough - 4200025137

Megan,

It seems Hollingworth Lake was 'transferred' to UU back in the 70's and there is a feeder pipe from the lake to the canal. I am not sure if this pipe transferred to UU. The easement is for the this feeder pipe. The easement grantee was the Rochdale Canal Company so I am not sure if the easement has been transferred to UU.

The orange and pink lines are DPA boundary lines – something to do with clean water.

Eugene,

What is a DPA?

Please could you provide Megan with some information about Hollingworth Lake. Is the green broken line shown below the canal feeder pipe or a pressurized pipe?

Regards

Neil

From: Megan Berry [<mailto:meganberry@betts-associates.co.uk>]

Sent: 11 April 2019 15:26

To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>; O'Brien, Neil

Cc: Dodd, Matthew <Matthew.Dodd@uuplc.co.uk>

Subject: RE: UU Pre-Development Enquiry - Hollingworth Road, Littleborough - 4200025137

Hi Neil,

Please can you respond to my email ASAP the client is keen to gain clarification, or if it is easier please ring me on the number below.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

BETTS HYDRO
Consulting Engineers

Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY
Chester +44 (0)1244 289041

meganberry@betts-associates.co.uk
www.betts-associates.co.uk

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From: Megan Berry
Sent: 08 April 2019 09:00
To: 'Wastewater Developer Services' <WastewaterDeveloperServices@uuplc.co.uk>; O'Brien, Neil
Cc: 'Dodd, Matthew' <Matthew.Dodd@uuplc.co.uk>
Subject: RE: UU Pre-Development Enquiry - Hollingworth Road, Littleborough - 4200025137

Good Morning Neil,

Thank you for your email, it was understood through previous correspondence (see attached) that the pipe crossing the site is a pressurized raw water distribution main owned by UU. Please can you confirm?

Furthermore, please can you confirm what the easement crossing site, shown by the purple line, is for? As we have no records of a pipe being located within this area. Also please can you confirm what the blue and orange lines stand for on the snippet you sent over?

It would be greatly appreciated if you could clarify these either by email or over the phone as soon as possible.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

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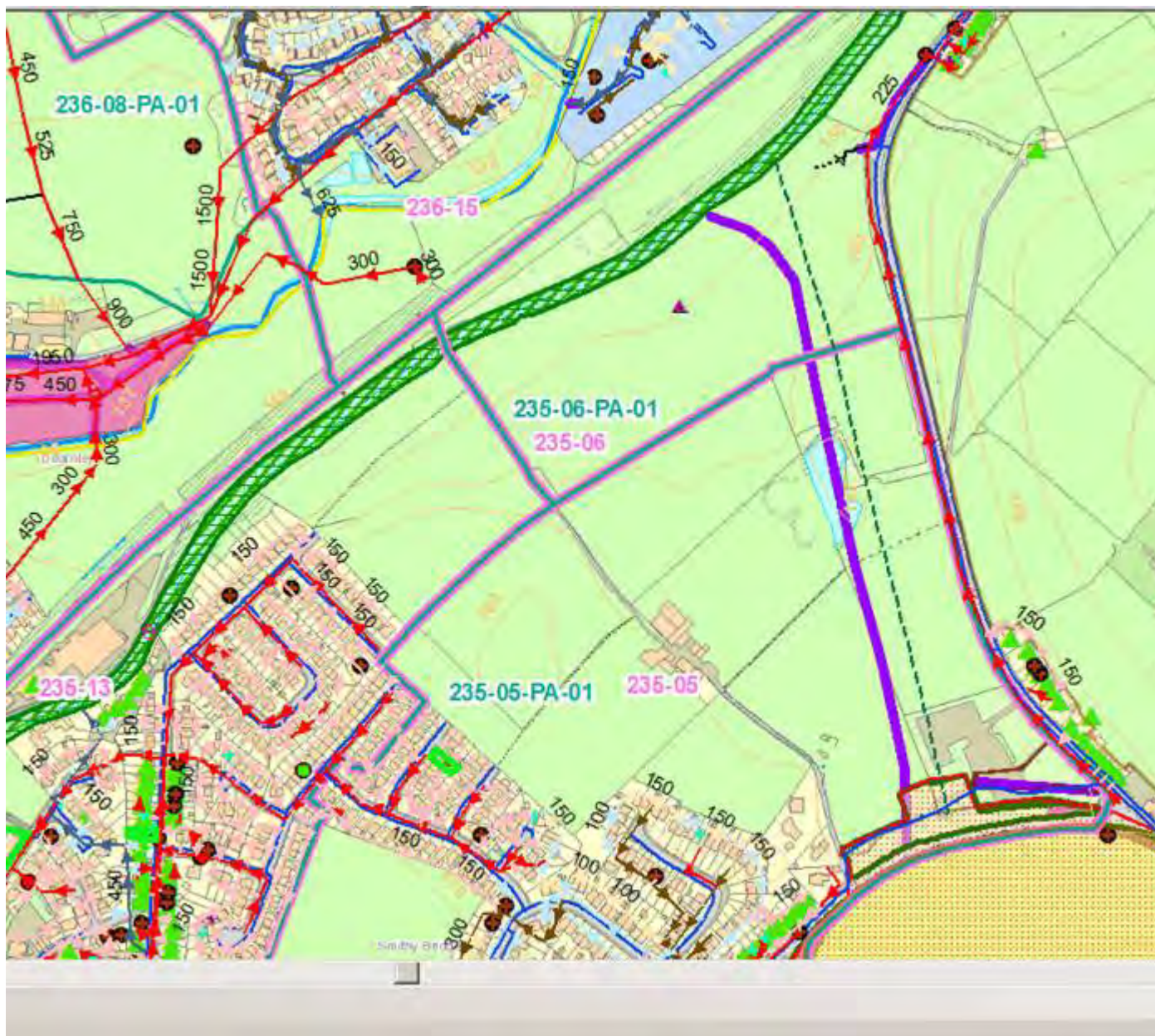
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From: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Sent: 05 April 2019 14:05
To: Megan Berry <meganberry@betts-associates.co.uk>; Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Subject: RE: UU Pre-Development Enquiry - Hollingworth Road, Littleborough - 4200025137



From: Megan Berry [<mailto:meganberry@betts-associates.co.uk>]

Sent: 22 March 2019 09:33

To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>

Subject: UU Pre-Development Enquiry - Hollingworth Road, Littleborough

UU PREDEVELOPMENT ENQUIRY. Pro-forma attached.

To Whom It May Concern,

We are currently preparing a Flood Risk Management Assessment and Drainage Management Strategy to support a residential planning application on land off Hollingworth Road in Littleborough. As part of the preparation, a drainage management strategy has been devised and at this stage we are seeking to begin discussions with UU with regards to the proposed surface water and foul water: attached is the pre-application advice form with supporting information as required.

Surface Water:

Surface water discharge options have been assessed in accordance with the sustainable drainage hierarchy. Given the presence of underlying coal measures in the sub geology and the areas mining history, an infiltration-based solution is not likely to be practical due to the high potential for leaching of contaminants from the underlying coal

measures. Furthermore, given the mining history there is potential for further engineering constraints to be present onsite, restricting the location of Soakaway features within the site boundaries. This issue would be exacerbated due to the steep gradient across the site. The adjacent site has planning permission (11/D55085) which furthermore supports that infiltration is unlikely to be practical on this site.

Assuming infiltration will not be feasible based on the information reviewed, then in accordance with the drainage hierarchy the next method to be explored is to discharge surface water run-off to a watercourse. The nearest watercourse to site is the River Roch (Main River) located approximately 450m to the north of site beyond the canal and railway. Given the engineering constraints associated with routing to the Main River it is unlikely that a direct discharge from site to the River Roch will be achievable. The Rochdale Canal and Rochdale Railway Line form the two primary constraints to achieve this direct connection, routing would need to span across 450m beneath a canal structure and railway line. Due to these constraints we have considered the potential alternatives.

Given that infiltration and a connection into the River Roch is unlikely to offer a surface water management solution for the site, it is proposed that the development mimics the existing regime and continues to discharge into the canal. The Rochdale Canal is located adjacent to the northern boundary of site and as previously discussed it is understood that the site naturally drains via overland run-off into the canal. It is therefore proposed the development site mimics the existing situation and discharges at the restricted pre-development greenfield rate. However, as the Canals and Rivers Trust are not a statutory drainage authority, they are not obliged to accept discharges into their network. Pre-development discussion with the CRT are currently being undertaken however a response is proving difficult to obtain.

If a new formal outfall into the Rochdale Canal cannot be agreed, then the alternative would be to consider discharging into the public combined sewer network (225mm dia.) within Hollingworth Road to the east of site. It is not clear whether this existing pipe length has sufficient capacity to cater for the flows discharging from the development. Detailed design will confirm the exact point of outfall location and whether a full gravity solution is feasible (not assumed to be feasible due to existing situation). Any new proposed point of connection will be agreed with United Utilities. In accordance with the SuDS Manual (CIRIA) and the Non-Technical Standards for SuDS (March 2015) all sites should endeavour to achieve as close to pre-development greenfield rates as is viable. The proposals are therefore to discharge to the public combined sewer at the restricted pre-development greenfield rate of 114.0l/s (QBar). This rate of discharge will be reviewed during detailed design stage when existing drainage systems have been investigated and updated accordingly if required.

Foul Water:

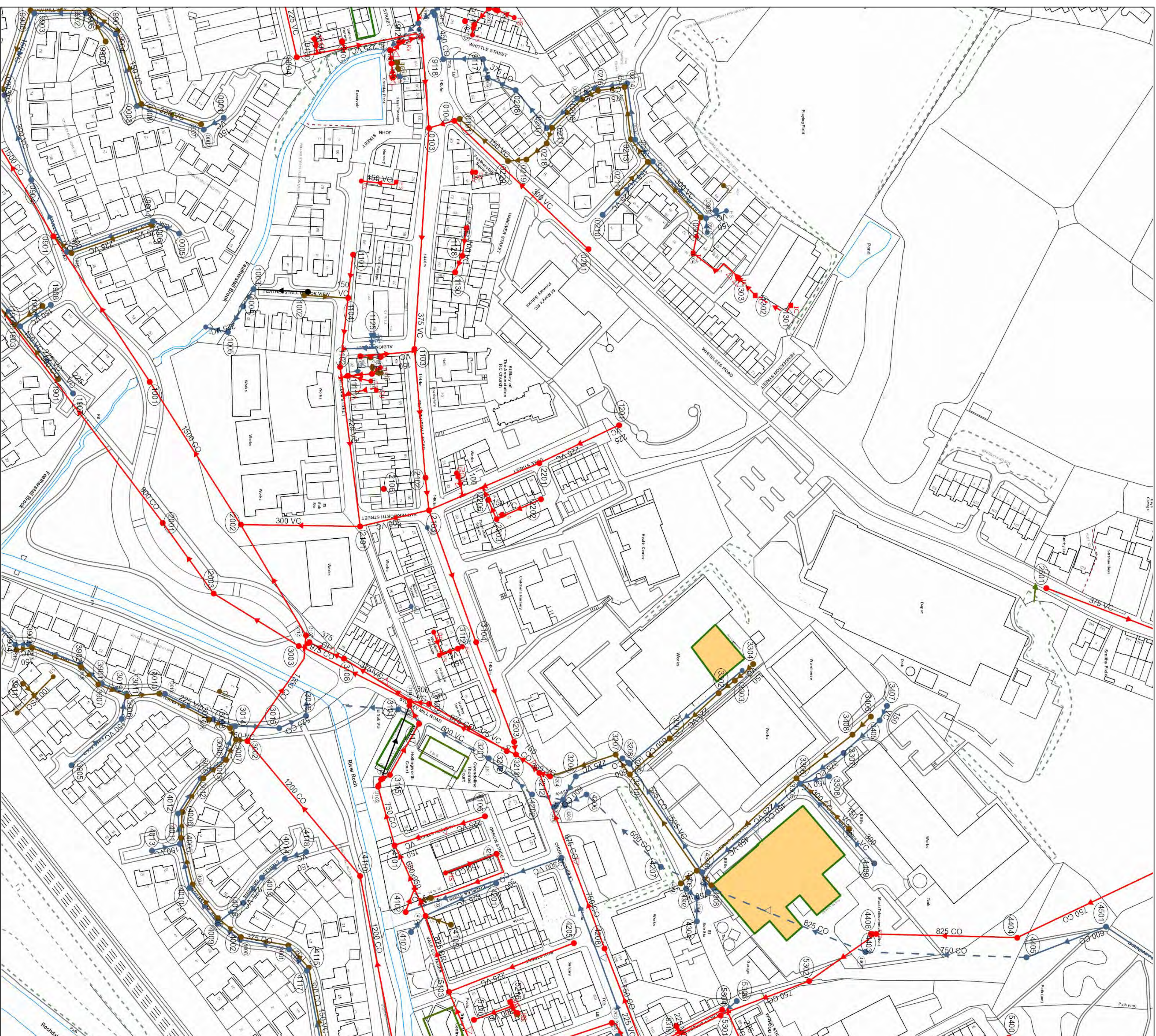
Review of the UU sewer records identify there to be public sewer infrastructure in proximity to the site. The development site is undeveloped at present and therefore, there are no onsite foul water flows currently generated thus no existing foul water connections present. The proposals for foul water management at the site are to discharge into the nearest foul water sewer compatible for a public sewer asset. The nearest sewer would be the public combined water sewer (225mm dia.) located within Hollingworth Road to the east of site. Early discussions with UU are recommended to ensure there will be sufficient capacity. Furthermore, UU must consent to any proposed works to the public sewer network. Based on the proposals for the construction of approximately 200no. units collectively the approximate peak foul water flows generated by the site overall is 9.2l/s. This is based on 4000 litres per dwelling per 24 hours; the guidance contained within Sewers for Adoption (SfA).

We are ultimately seeking to identify United Utilities preferred point of connection and to confirm any constraints. It is acknowledged that offsite work will likely be required to achieve connection into the public sewer network. Hopefully the summary above and the attached are of assistance and allow agreement in principle to be given, do not hesitate to contact me on the details below should you require any further assistance.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

BETTS HYDRO
Consulting Engineers

[illegible]

LEGEND

Symbol	Description
Red line	Head of System
Orange line	Extent of Survey
Yellow line	Rodding Eye
Green line	Inlet
Blue line	Discharge Point
Purple line	Vortex
Brown line	Penstock
Pink line	Without Chamber
Light blue line	Air Valve
Light green line	Non Return Valve
Light orange line	Sootyway
Light yellow line	Gully
Light green line	Cascade
Light blue line	Flow Meter
Light orange line	Hatch Box
Light green line	Summit
Light yellow line	Drop Shaft
Light blue line	Office Pitile
Light green line	Sewer Material
Light orange line	Manhole Function
Light green line	Sewer Shape
Light green line	Sewer Material

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

MANHOLE FUNCTION

Symbol	Description
Red line	Head of System
Orange line	Extent of Survey
Yellow line	Rodding Eye
Green line	Inlet
Blue line	Discharge Point
Purple line	Vortex
Brown line	Penstock
Pink line	Without Chamber
Light blue line	Air Valve
Light green line	Non Return Valve
Light orange line	Sootyway
Light yellow line	Gully
Light green line	Cascade
Light blue line	Flow Meter
Light orange line	Hatch Box
Light green line	Summit
Light yellow line	Drop Shaft
Light blue line	Office Pitile
Light green line	Sewer Material
Light orange line	Manhole Function
Light green line	Sewer Shape
Light green line	Sewer Material

SEWER SHAPE

Symbol	Description
Red line	Head of System
Orange line	Extent of Survey
Yellow line	Rodding Eye
Green line	Inlet
Blue line	Discharge Point
Purple line	Vortex
Brown line	Penstock
Pink line	Without Chamber
Light blue line	Air Valve
Light green line	Non Return Valve
Light orange line	Sootyway
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Light green line	Cascade
Light blue line	Flow Meter
Light orange line	Hatch Box
Light green line	Summit
Light yellow line	Drop Shaft
Light blue line	Office Pitile
Light green line	Sewer Material
Light orange line	Manhole Function
Light green line	Sewer Shape
Light green line	Sewer Material

SEWER MATERIAL

Symbol	Description
Red line	Head of System
Orange line	Extent of Survey
Yellow line	Rodding Eye
Green line	Inlet
Blue line	Discharge Point
Purple line	Vortex
Brown line	Penstock
Pink line	Without Chamber
Light blue line	Air Valve
Light green line	Non Return Valve
Light orange line	Sootyway
Light yellow line	Gully
Light green line	Cascade
Light blue line	Flow Meter
Light orange line	Hatch Box
Light green line	Summit
Light yellow line	Drop Shaft
Light blue line	Office Pitile
Light green line	Sewer Material
Light orange line	Manhole Function
Light green line	Sewer Shape
Light green line	Sewer Material

Address or Site Reference:

4 HEAD LANE,
LITTLEBOROUGH,
OL15 0DW

Scale: 1:1250

OS sheet SD9316SW

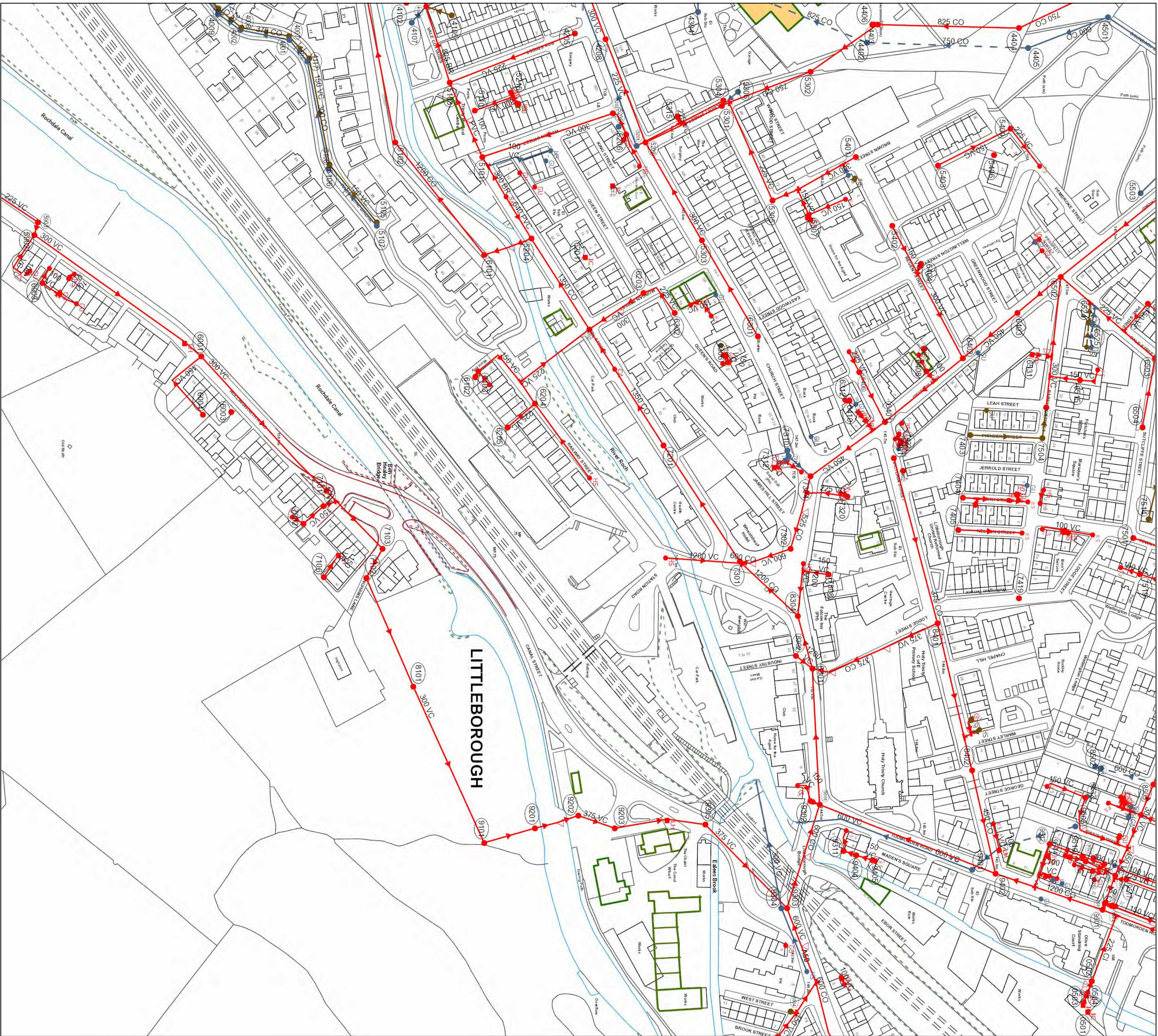
Number.

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Date: 04/09/2018

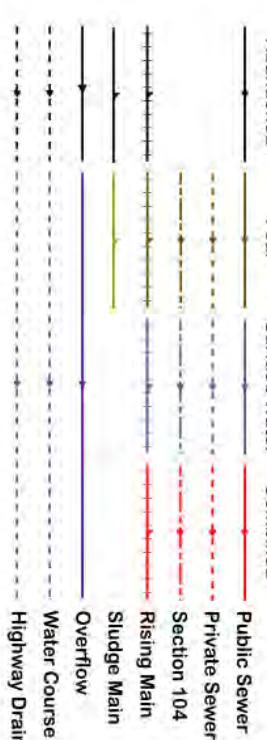
Sheet: 1 of 7

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145.97	CO	145.97	150	VC	2.16222	145.97
145.98	CO	145.98	150	VC	2.16222	145.98
145.99	CO	145.99	150	VC	2.16222	145.99
146.00	CO	146.00	150	VC	2.16222	146.00
146.01	CO	146.01	150	VC	2.16222	146.01
146.02	CO	146.02	150	VC	2.16222	146.02
146.03	CO	146.03	150	VC	2.16222	146.03
146.04	CO	146.04	150	VC		

LEGEND



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

- Manhole
- Head of System
- Extent of Survey
- Redding Eye
- Inlet
- Ducting Point
- Valve
- Paradeck
- Washout Chamber
- Valve
- Air Valve
- Non Return Valve
- Scaleway
- Gully
- Cascade
- Flow Meter
- Hatch Box
- Oil Interceptor
- Summit
- Drop Shaft
- Office Plate
- Change of Characteristic
- Side Entry Manhole
- Outfall
- Screen Chamber
- Inspection Chamber
- Bifurcation Chamber
- Lamp Hole
- T Junction / Saddle
- Catchpit
- Valve Chamber
- Vent Column
- Vertical Chamber
- Paradeck Chamber
- Network Storage Tank
- Sewer Overflow
- WW Treatment Works
- Septic Tank
- Control Kiosk

MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OV Overflow

SEWER SHAPE

- CI Circular
- EA Elliptical
- OV Oval
- BA Barrel
- FT Flat Top
- HO Horseshoe
- RE Rectangular
- UN Unspecified
- SO Square

SEWER MATERIAL

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

Address or Site Reference:

4 HEAD LANE,
LITTLEBOROUGH,
OL15 0DW

OS sheet SD9315SE

Number:

Scale: 1:1250 Date: 04/09/2018

Nodes: 20

Sheet: 3 of 7

Printed by: Property Searches

SEWER RECORDS

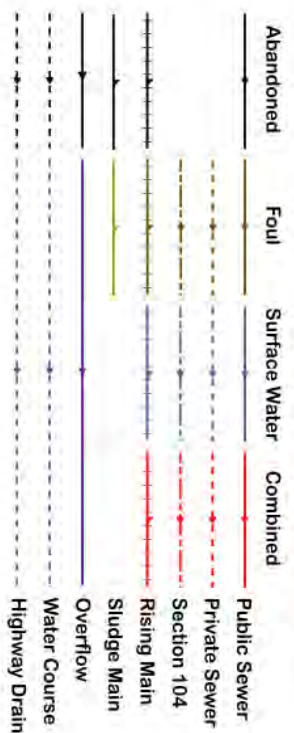


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Hollingworth Lake Country Park

LEGEND



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

- Manhole
- Head of Survey
- Rodding Eye
- Inlet
- Discharge Point
- Parotack
- Valve
- Workout Chamber
- Non Return Valve
- Air Valve
- Sewerage
- Gully
- Cascade
- Flow Meter
- Septic Tank
- Oil Interceptor
- Summit
- Drop Shaft
- Office Plate

MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OV Overflow

SEWER SHAPE

- CI Circular
- EA Elliptical
- OV Oval
- BA Barrel
- FT Flat Top
- RE Rectangular
- UN Unspecified
- SO Square

SEWER MATERIAL

- AC Asbestos Cement
- BR Brick
- PE Polyethylene
- RP Reinforced Plastic Matrix
- CO Concrete
- CSB Corrugated Segment Balled
- CC Concrete Segment Unballed
- CC Concrete Box Culverted
- PPC Plastic Steel Composite
- GC Glass Reinforced Plastic
- DI Ductile Iron
- PVC Polyvinyl Chloride
- CI Cast Iron
- SI Spun Iron
- ST Steel
- VC Vitified Clay
- PP Polypropylene
- PF Pitch Fibre
- MC Masonry, Curved
- MA Masonry, Flared
- U Unspecified

Address or Site Reference:

4 HEADLANE,
LITTLEBOROUGH,
OL15 0DW

OS sheet SD9315NW

Number: 238

Scale: 1:1250

Notes: 5 of 7

Sheet: 5 of 7

Printed by: Property Searches

SEWER RECORDS

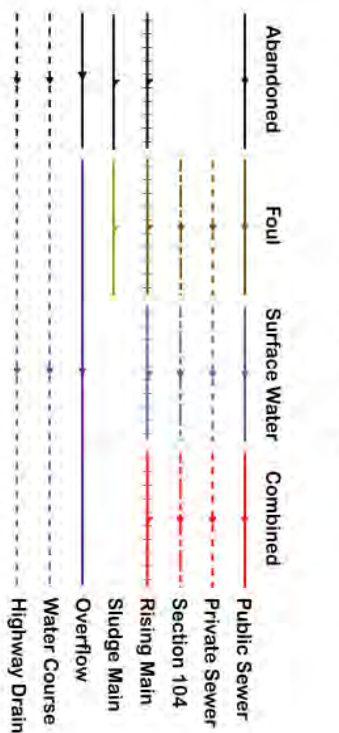


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LEGEND



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

- Manhole
- Head of System
- Extent of Survey
- Rodding Eye
- Inlet
- Discharge Point
- Valve
- Parotack
- Non Return Valve
- Skewway
- Gully
- Cascade
- Flow Meter
- Septic Tank
- Control Kiosk
- Oil Interceptor
- Summit
- Drop Shaft
- Orifice Plate

MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OV Overflow

SEWER SHAPE

- CI Circular
- EA Elliptical
- OV Oval
- BA Barrel
- FT Flat Top
- HO Horseshoe
- RE Rectangular
- UN Unspecified
- SO Square

SEWER MATERIAL

- AC Adhesive Cement
- BR Brick
- PE Polyethylene
- RP Reinforced Plastic Matrix
- CO Concrete
- CSB Concrete Segment Balled
- CC Concrete Segment Unballed
- CC Concrete Box Culverted
- PSC Plastic Steel Composite
- GR Glass Reinforced Plastic
- DI Ductile Iron
- PVC Polyvinyl Chloride
- CI Cast Iron
- SI Spun Iron
- ST Steel
- VC Vitreous Clay
- PP Polypropylene
- PF Pitch Fibre
- MMC Masonry, Curved
- MA Masonry, Flared
- U Unspecified

Address or Site Reference:

4 HEADLANE,
LITTLEBOROUGH,
OL15 0DW

OS sheet SD9215NE
Number: 168
Scale: 1:1250
Nodes: 6 of 7
Date: 04/09/2018
Sheet: 6 of 7

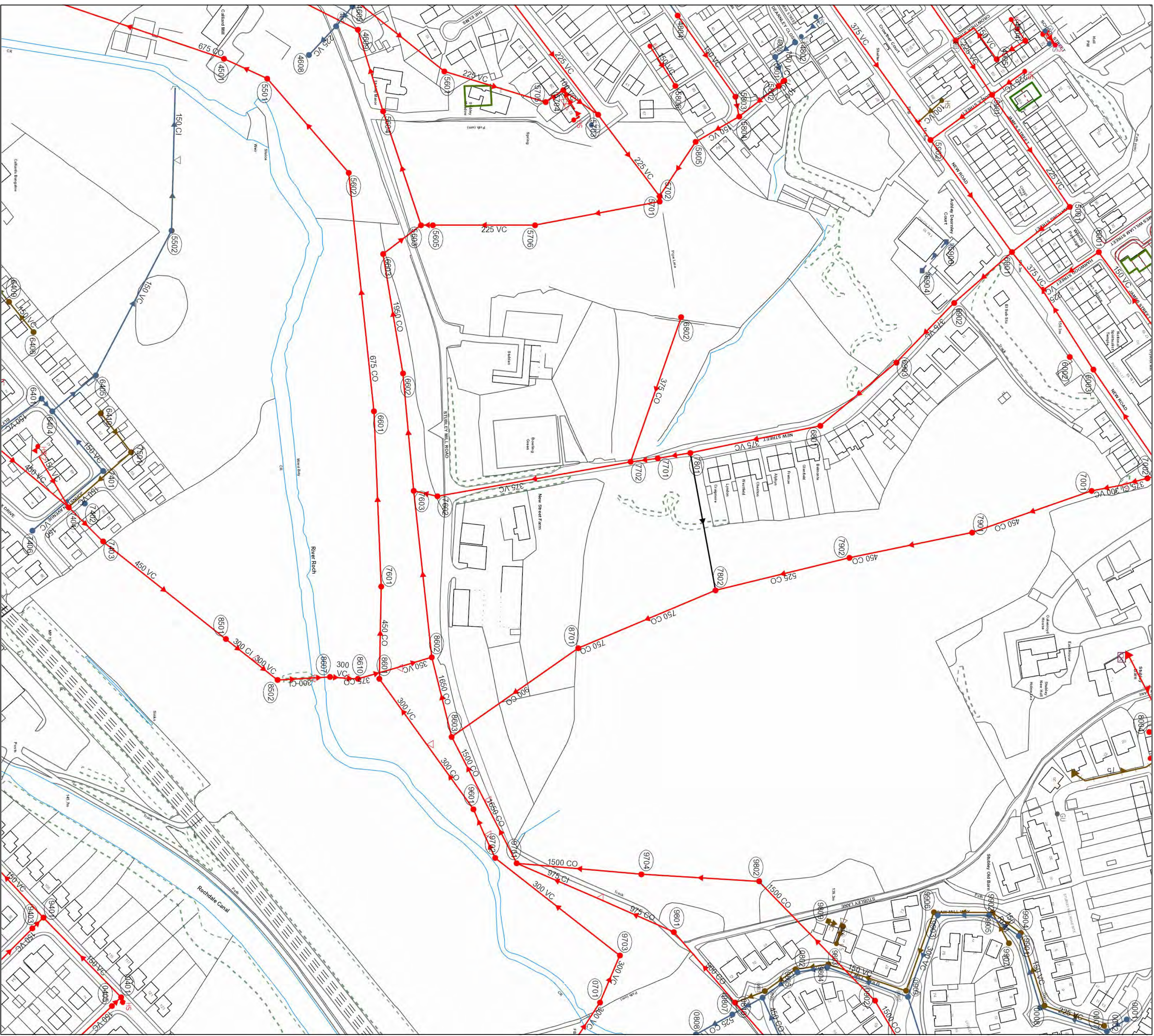
Printed by: Property Searches

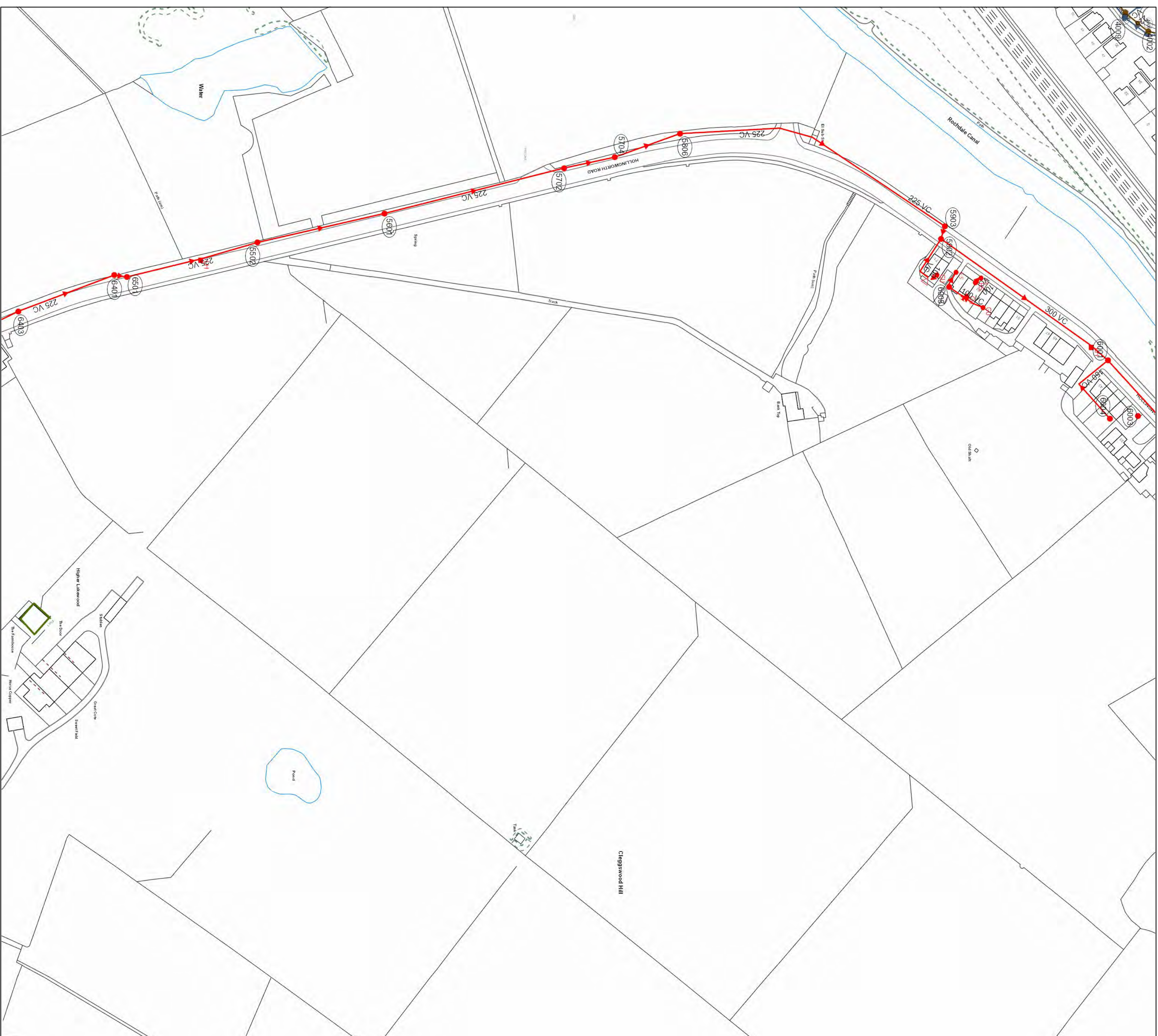
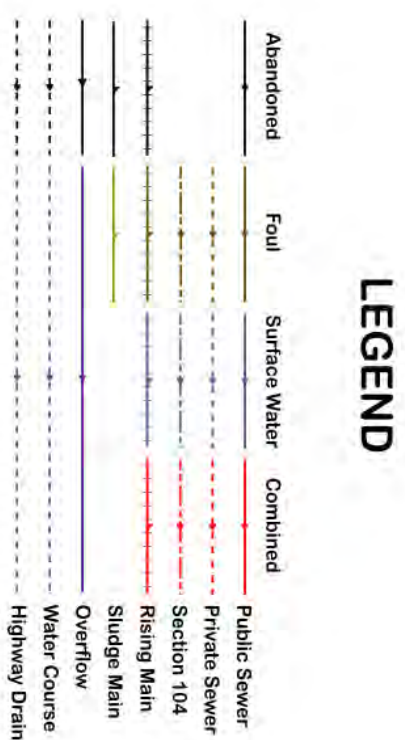
SEWER RECORDS



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[illegible][illegible]

All point assets follow the standard colour convention.

- | | |
|-------------------|--------------------------|
| Members of System | Side Entry Manhole |
| Head of System | Outfall |
| Extent of Survey | Screen Chamber |
| Reading Eye | Inspection Chamber |
| Inlet | Bifurcation Chamber |
| Discharge Point | Jump Pole |
| Verte | 1 Junction / Saddle |
| Parastock | Catchpit |
| Wastelot Chamber | Valve Chamber |
| Valve | Well Column |
| At Valve | Vortex Chamber |
| Non Return Valve | Pressure Chamber |
| Seaboard | Pressure Storage Tank |
| Gully | Sewer Overflow |
| Cascade | WW Treatment Works |
| Flow Meter | WW Pumping Station |
| Heads Box | Septic Tank |
| Oil Interceptor | Control Kitchen |
| Summit | |
| Drop Shaft | |
| Office Plant | |
| | Change of Characteristic |

- | MANHOLE FUNCTION | |
|------------------|---------------|
| FO | Foul |
| SW | Surface Water |
| CO | Combined |
| OV | Overflow |

- | SEWER SHAPE | |
|----------------|----------------|
| CI Circular | TR Trapezoidal |
| EG Egg | AR Arch |
| OV Oval | BA Barrel |
| FT Flat Top | HO Horseshoe |
| RE Rectangular | UN Unspecified |
| SO Square | |

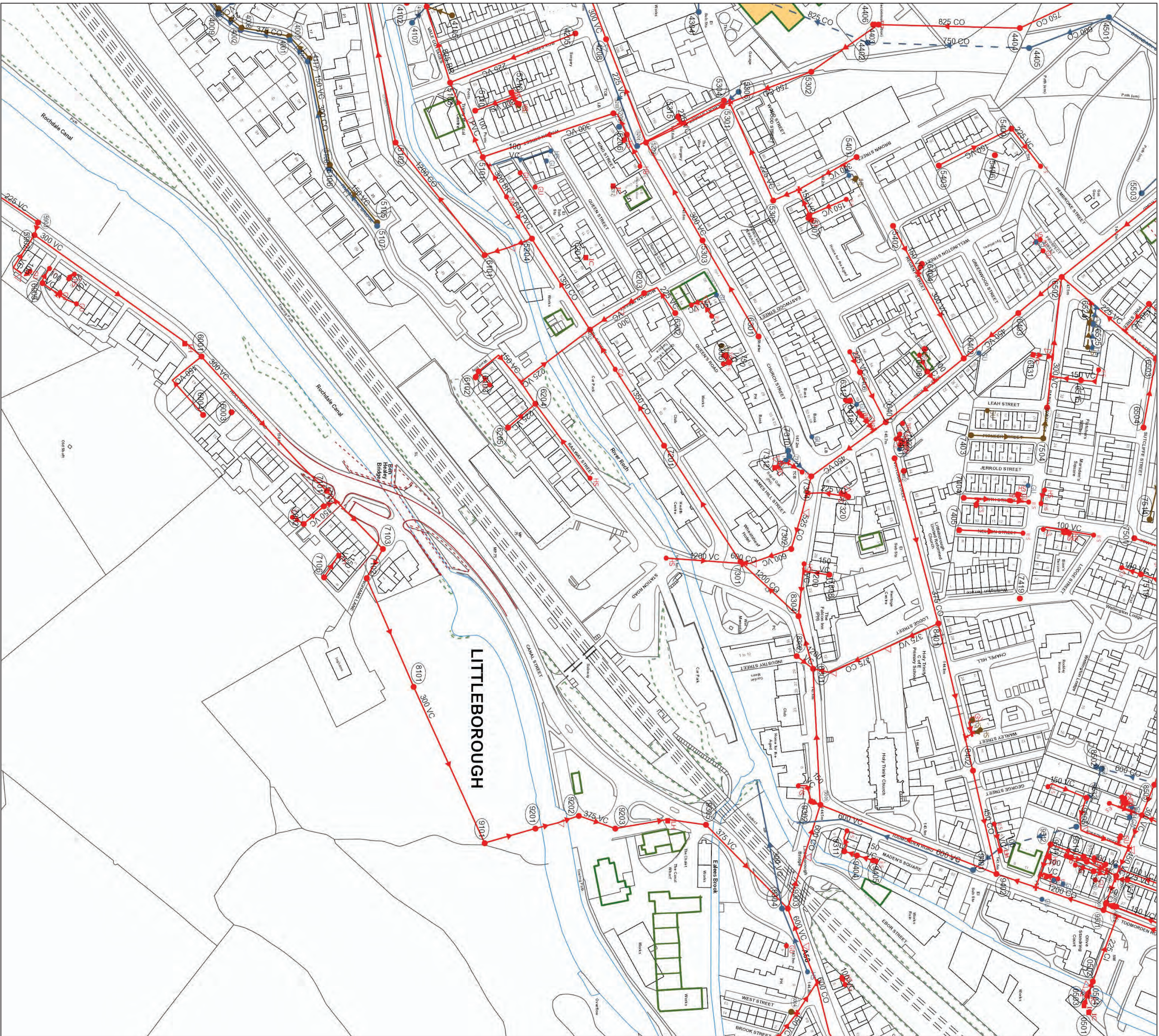
- | SRM# | SRM MATERIAL |
|------|---------------------------|
| AC | Adhesive Cement |
| BE | Box |
| PE | Polyethylene |
| RF | Reinforced Plastic Matrix |
| CO | Concrete |
| CSB | Concrete Segment Bolted |
| CSU | Concrete Segment Unbolted |
| CC | Concrete Box Cylindrical |
| PSC | Plastic Shell Composite |
| GR | Glass Reinforced Plastic |
| DU | Ductile Iron |
| PC | Polyvinyl Chloride |
| CI | Cast Iron |
| SI | Spun Iron |
| ST | Steel |
| VC | Vertical Clay |
| PP | Polypropylene |
| PF | Paper Foil |
| MC | Masonry, Coursed |
| MR | Masonry, Random |
| 1 | Unstayed |

Address or Site Reference:

OS sheet SD9315NE
Number:
Scale: 1:1250 Date: 04/09/2010
Nodes: 45
Sheet: 7 of 7
Printed by: Property Searches

SEWER RECORDS

United utilities
helping life flow smooth.



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Ratio	Code	Func	Invert	Size x	Shape	Mat	Length	CD	Info	Code	Func	Invert	Size x	Shape	Mat	Length	CD
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5403	5403	CO	142.27	144	110	VC	2.162000	1.18 124									
5404	5404	CO	142.27	144	110	VC	2.162000	1.18 124									
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5407	5407	CO	142.27	144	110	VC	2.162000	1.18 124									
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5411	5411	CO	142.27	144	110	VC	2.162000	1.18 124									
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5497	5497	CO	142.27	144													

LEGEND



All point assets follow the standard colour convention:

- red - combined
 - blue - surface water
 - brown - foul
 - purple - overflow
- Manhole
 - Head of System
 - Extent of Survey
 - Redding Eye
 - Inlet
 - Discharge Point
 - Valve
 - Parastock
 - Wastout Chamber
 - Valve
 - Air Valve
 - Non Return Valve
 - Gully
 - Cascade
 - Flow Meter
 - Hatch Box
 - Oil Interceptor
 - Summit
 - Drop Shaft
 - Office Plate
- Side Entry Manhole
 - Outfall
 - Screen Chamber
 - Inspection Chamber
 - Bifurcation Chamber
 - Lamp Hole
 - T Junction / Saddle
 - Catchpit
 - Valve Chamber
 - Parastock Chamber
 - Network Storage Tank
 - Sewer Overflow
 - WW Treatment Works
 - Septic Tank
 - Control Kiosk
 - Change of Characteristic

MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OV Overflow

SEWER SHAPE

- CI Circular
- EA Elliptical
- OV Oval
- FT Flat Top
- RE Rectangular
- UN Unspecified
- SQ Square

SEWER MATERIAL

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

Address or Site Reference:

4 HEAD LANE,
LITTLEBOROUGH,
OL15 0DW

OS sheet SD9315SE
Number: 20
Date: 04/09/2018

Scale: 1:1250
Nodes: 20
Sheet: 3 of 7

Printed by: Property Searches

SEWER
RECORDS

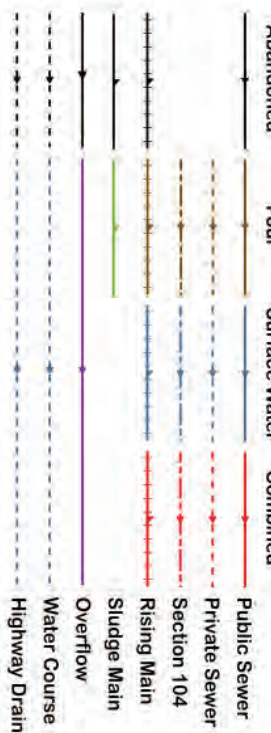


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Hollingworth Lake Country Park

LEGEND



All point assets follow the standard colour convention:

red - combined

blue - surface water

purple - overflow

brown - foul



MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OV Overflow

SEWER SHAPE

- CI Circular
- RA Trapezoidal
- E9 Egg
- AR Arch
- OV Oval
- BA Barrel
- FF Flat Top
- HO Horseshoe
- RE Rectangular
- UN Unspecified
- SQ Square

SEWER MATERIAL

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

Address or Site Reference:

4 HEADLANE,
LITTLEBOROUGH,
OL15 0DW

OS sheet SD9315SW

Number:

Scale: 1:1250

Nodes: 123

Sheet: 4 of 7

Date: 04/09/2018

Printed by: Property Searches

SEWER RECORDS



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Ratio	Cover	Func	Invert	Size x	Shape	Matl	Length	Grid	Notes
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0403	106.57	CO	150	150		VC	7.01068	18.29	
0404	106.58	CO	150	150		VC	7.01068	18.29	
0405	106.59	CO	150	150		VC	7.01068	18.29	
0406	106.60	CO	150	150		VC	7.01068	18.29	
0407	106.61	CO	150	150		VC	7.01068	18.29	
0408	106.62	CO	150	150		VC	7.01068	18.29	
0409	106.63	CO	150	150		VC	7.01068	18.29	
0410	106.64	CO	150	150		VC	7.01068	18.29	
0411	106.65	CO	150	150		VC	7.01068	18.29	
0412	106.66	CO	150	150		VC	7.01068	18.29	
0413	106.67	CO	150	150		VC	7.01068	18.29	
0414	106.68	CO	150	150		VC	7.01068	18.29	
0415	106.69	CO	150	150		VC	7.01068	18.29	
0416	106.70	CO	150	150		VC	7.01068	18.29	
0417	106.71	CO	150	150		VC	7.01068	18.29	
0418	106.72	CO	150	150		VC	7.01068	18.29	
0419	106.73	CO	150	150		VC	7.01068	18.29	
0420	106.74	CO	150	150		VC	7.01068	18.29	
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0529	107.83	CO	150	150		VC	7.01068	18.29	
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0531	107.85	CO	150	150		VC	7.01068	18.29	

LEGEND



All point assets follow the standard colour convention:

- red - combined
 - blue - surface water
 - brown - foul
 - purple - overflow
- Manhole
 - Head of System
 - Exit of Survey
 - Redding Eye
 - Inlet
 - Discharge Point
 - Valve
 - Prestack
 - Wastout Chamber
 - Valve
 - Air Valve
 - Non Return Valve
 - Gully
 - Cascade
 - Flow Meter
 - Hatch Box
 - Oil Interceptor
 - Summit
 - Drop Shaft
 - Office Plate
- Site Entry Manhole
 - Outfall
 - Screen Chamber
 - Inspection Chamber
 - Bifurcation Chamber
 - Lamp Hole
 - T Junction / Saddle
 - Calchpot
 - Valve Chamber
 - Vent Chamber
 - Prestack Chamber
 - Network Storage Tank
 - Sewer Overflow
 - WW Treatment Works
 - Septic Tank
 - Control Kiosk
- Change of Characteristic

MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OY Overflow

SEWER SHAPE

- CI Circular
- TR Trapezoidal
- EG Egg
- AR Arch
- OV Oval
- BA Barrel
- FT Flat Top
- HO Horse Shoe
- RE Rectangular
- UN Unspecified
- SD Square

SEWER MATERIAL

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

Address or Site Reference:

4 HEAD LANE,
LITTLEBOROUGH,
OL15 0DW

OS sheet SD9315NE
Number: 11250
Scale: 1:1250

Date: 04/09/2018
Sheet: 45
7 of 7
Printed by: Property Searches

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

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APPENDIX D: LPA/LLFA CORRESPONDENCE

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Megan Berry

From: Megan Berry
Sent: 05 August 2022 15:43
To: 'Stephen.McCann@Rochdale.Gov.UK'
Subject: FW: Flood Risk Background Information
Attachments: LOCATION PLAN.pdf

F.A.O Flood Risk, Drainage and/or Planning department

Please forward to the correct department/ office

Good Afternoon Stephen,

Hollingworth Road, Littleborough.

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the site above (see location plan attached), including details of historical flooding, predicted flood water levels and current drainage issues; this would be greatly appreciated.

It is understood that the site is located within Flood Zone 1 but is at risk from reservoir flooding, we are therefore seeking further information into what would be required to be included within an FRA to show the development proposals are not at risk during an event.

If there are any other specific requirements that you require in a scope of works for this site please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

BETTS HYDRO

Engineering Consultants

Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY

CHESTER - 01244 289041

meganberry@betts-associates.co.uk

www.betts-associates.co.uk

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Megan Berry

From: Stephen McCann <Stephen.McCann@Rochdale.Gov.UK>
Sent: 19 December 2018 17:05
To: Megan Berry
Subject: FW: Pre Planning - Historical Flood Risk (Hollingworh Lake) request

Megan:- for your ref:

From: Andrew Eadie
Sent: 19 December 2018 16:55
To: Stephen McCann
Subject: RE: Pre Planning - Historical Flood Risk (Hollingworh Lake) request

Hi Stephen –

I've checked our database, and we don't have any record of historic flooding on this site. As far as the Boxing Day 2015 flooding is concerned, there is no record of flooding on this site but the records only really relate to properties rather than areas of land so it is possible that there was flooding on this site but it wouldn't necessarily have been recorded.

Cheers

Andrew Eadie
Principal Planning Officer
Planning



01706 924371



andrew.eadie@rochdale.gov.uk

Rochdale Borough Council
Floor 3, Number One Riverside
Smith Street, Rochdale, OL16 1XU

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For news and social media updates go to www.rochdale.gov.uk/news

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From: Stephen McCann
Sent: 19 December 2018 16:06
To: Andrew Eadie
Cc: meganberry@betts-associates.co.uk
Subject: Pre Planning - Historical Flood Risk (Hollingworh Lake) request

Hello Andrew,

I received a request (see below) for any historical records of flooding to the immediate north of Hollingworth Lake. The location plan is attached.

Do you have any records?

Do you know if this area had any flooding in Dec 2015?

The EA flood risk map shows none.

regards

Stephen McCann

Drainage & Flooding Engineer

Highways, Property & Strategic Housing



☎ 01706 924606

✉ stephen.mccann@rochdale.gov.uk

From: Megan Berry [<mailto:meganberry@betts-associates.co.uk>]

Sent: 17 December 2018 17:32

To: Stephen McCann

Subject: Flood Risk Background Information

F.A.O Flood Risk, Drainage and/or Planning department

Please forward to the correct department/ office

Good Afternoon Stephen,

Hollingworth Road, Littleborough.

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the site above (see location plan attached), including details of historical flooding, predicted flood water levels and current drainage issues; this would be greatly appreciated.

It is understood that the site is located within Flood Zone 1 but is at risk from reservoir flooding, we are therefore seeking further information into what would be required to be included within an FRA to show the development proposals are not at risk during an event.

If there are any other specific requirements that you require in a scope of works for this site please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM

Graduate Flood Risk Analyst

BETTS HYDRO

Engineering Consultants

Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY

CHESTER - 01244 289041

meganberry@betts-associates.co.uk

www.betts-associates.co.uk

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Megan Berry

From: Stephen McCann <Stephen.McCann@Rochdale.Gov.UK>
Sent: 19 December 2018 16:33
To: Megan Berry
Subject: RE: Hollingworth devl. site - Flood Risk Background Information
Attachments: Drainage Feasibility Plan 2.pdf; Rochdale Borough Council Drainage Guidance.docx

Dear Megan,

Your site plan seems to incorporate land for which another Planning Application was made: 17/01188/VRCON Former Akzo Noble Site, which in turn is a variation on an earlier application 11/D55085 (year 2011). I attach the Drainage Designer's Prelim plan. If you want to look at documents, this is available on the Planning Website. I notice that this application didn't include an FRA and a very limited Drainage Strategy. The Decision Notice requires a detailed design to be submitted for approval to RBC prior to starting work on the site.

Answering your queries:-

- historical flooding: *Andrew Eadie represents RBC's Lead Local Flood Authority and has any records – he will respond to you.*
- predicted flood water levels: *this information, if available is obtained by request to the Environment Agency.*
- current drainage issues – *this is a mix of brownfield (former Akzo site) and greenfield; I would assume that any such drainage that may have been present is no longer viable.*

It is understood that the site is located within Flood Zone 1 but is at risk from reservoir flooding, we are therefore seeking further information into what would be required to be included within an FRA to show the development proposals are not at risk during an event:- *United Utilities have information on their reservoirs; the EA also provides mapping information on reservoir flood risks.*

If there are any other specific requirements that you require in a scope of works for this site please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage – *I attach a standard info sheet.*

regards

Stephen McCann

Drainage & Flooding Engineer
Highways, Property & Strategic Housing



☎ 01706 924606

✉ stephen.mccann@rochdale.gov.uk

Rochdale Borough Council
Floor 2, Number One Riverside
Smith Street, Rochdale, OL16 1XU

From: Megan Berry [mailto:meganberry@betts-associates.co.uk]
Sent: 17 December 2018 17:32
To: Stephen McCann
Subject: Flood Risk Background Information

F.A.O Flood Risk, Drainage and/or Planning department

Please forward to the correct department/ office

Good Afternoon Stephen,

Hollingworth Road, Littleborough.

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the site above (see location plan attached), including details of historical flooding, predicted flood water levels and current drainage issues; this would be greatly appreciated.

It is understood that the site is located within Flood Zone 1 but is at risk from reservoir flooding, we are therefore seeking further information into what would be required to be included within an FRA to show the development proposals are not at risk during an event.

If there are any other specific requirements that you require in a scope of works for this site please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

BETTS HYDRO

Engineering Consultants

Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY

CHESTER - 01244 289041

meganberry@betts-associates.co.uk

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APPENDIX E: CRT CORRESPONDENCE

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Bloor Homes North West
2 -4 Whiteside Business Park
Station Road
Holmes Chapel
Cheshire
CW4 844

Your Ref [Ref]
Our Ref TPW-NOR-1920-048

Date: 18/01/2021

Dear

Subject: (HOLLINGSWORTH ROAD DEVELOPMENT) WATER DISCHARGE (SUBJECT TO CONTRACT)

Our technical specialists have now undertaken their review of the information provided and can confirm that your proposal is acceptable to the Canal & River Trust to a maximum discharge rate of **13.5 l/s**, based on the following conditions listed in the Trust attached review proforma letter.

Items that will require agreement with the Trust's Infrastructure Services team are:

Mitigations:

- Infrastructure Services Engineer to ensure discharge is limited to the peak run off volumes set – this should not increase the discharge beyond what is already observed and is proposed to be achieved through attenuation.
- Infrastructure Services Engineer to ensure oil interceptors are used on site.
- Infrastructure Services Engineer to ensure a bypass interception is used on site, or another suitable attenuation system.
- Infrastructure Services Engineer to ensure down pipes are sealed at ground entry to prevent contaminants being discharged into the canal.

The comments stated in this assessment by the Canal & River Trust are limited to the scope expressly specified. Accordingly, no right, consent (whether statutory or otherwise), contract or licence of any nature whatsoever is granted whether by implication, estoppel, reliance or otherwise.

Our Utilities Surveyor **Deborah McCormick** will now be in contact to progress the necessary commercial negotiations to allow the proposal to proceed.

Please note that any additional input required from the Trust for construction of the outfall or otherwise will be subject to the Code of Practice for Works Affecting the Canal & River Trust.

A handwritten signature in black ink, appearing to read 'Gareth Taylor', enclosed within a circular scribble.

Gareth Taylor
Works Engineer

Megan Berry

From: Megan Berry
Sent: 05 August 2022 15:43
To: 'Ken.Fowler@canalrivertrust.org.uk'
Cc: 'Customer.Services@canalrivertrust.org.uk'
Subject: RE: Historical Canal Flooding
Attachments: LOCATION PLAN.pdf

F.A.O Flood Risk, Drainage and/or Planning department

Please forward to the correct department/ office

Good Afternoon Ken,

Hollingworth Road, Littleborough.

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the site above (see location plan attached), including details of historical flooding, predicted flood water levels and current drainage issues; this would be greatly appreciated. If there are any other specific requirements that you require in a scope of works for this site please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

BETTS HYDRO

Engineering Consultants

Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY

CHESTER - 01244 289041

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Megan Berry

From: Mark Heath <Mark.Heath@canalrivertrust.org.uk>
Sent: 19 December 2018 10:58
To: Megan Berry
Cc: Ken Fowler; Customer Services
Subject: RE: Historical Canal Flooding
Attachments: Appendix A.PDF

Dear Megan,

RE:- Historical Canal Flooding: Hollingworth Road, Littleborough, Rochdale Canal

Further to your enquiry received 17 December 2018, Canal & River Trust can confirm the following:-

The Trust are not aware of any breach or overtopping events in the vicinity.

The Trust also add that whilst Hollingworth Reservoir provides a feed to the Rochdale Canal, this is not under the jurisdiction of the Trust, as is owned and maintained by United Utilities.

Further, please note that the canal pound (lock to lock) adjacent to the site identified is approximately 5.75km in length, with an average width of 14m.

Please be aware that we are unable to comment on the flood risk to individual properties or developments and interpretation of the information provided in this e-mail is your responsibility.

For further advice on flood risk from canals we have included some generic guidance, please refer to Appendix A attached.

We trust this is satisfactory, however if you do require any further information please do not hesitate to contact the undersigned.

Kind regards

Mark
Mark Heath
Water Engineer, Water Management Team

(North West, Yorkshire & the North East, East Midlands Regions)

Canal & River Trust | **Red Bull Yard** | Congleton Road South | **Church Lawton** | Stoke-on-Trent | **ST7 3AP**

We have published our 2017 Annual Lockage Report - [take a look at this year's figures here!](#)

From: Ken Fowler
Sent: 18 December 2018 14:08
To: Mark Heath <Mark.Heath@canalrivertrust.org.uk>
Cc: Customer Services <Customer.Services@canalrivertrust.org.uk>; Megan Berry <meganberry@betts-associates.co.uk>
Subject: RE: Historical Canal Flooding

Mark, you know this area a lot better than I do; please can you research and reply.

Thanks

Ken Fowler MICE, CEng
Principal Water Engineer
Water Management Team
Yorkshire & North East, East Midlands and North West Regions

T 0113 2816875

M 07710 175461

E Ken.Fowler@canalrivertrust.org.uk

W canalrivertrust.org.uk

Canal & River Trust, Fearn's Wharf, Neptune Street, Leeds, LS9 8PB

From: Megan Berry <meganberry@betts-associates.co.uk>

Sent: 17 December 2018 17:38

To: Ken Fowler <Ken.Fowler@canalrivertrust.org.uk>

Cc: Customer Services <Customer.Services@canalrivertrust.org.uk>

Subject: Historical Canal Flooding

F.A.O Flood Risk, Drainage and/or Planning department

Please forward to the correct department/ office

Good Afternoon Ken,

Hollingworth Road, Littleborough.

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the site above (see location plan attached), including details of historical flooding, predicted flood water levels and current drainage issues; this would be greatly appreciated. If there are any other specific requirements that you require in a scope of works for this site please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

BETTS HYDRO

Engineering Consultants

Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY

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APPENDIX F: LOCATION PLAN

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[illegible]

Location Plan

DATE: 14.02.2024
SCALE: 1:1250 @ A1
DRAWN: TJW
CHECKED: RTD



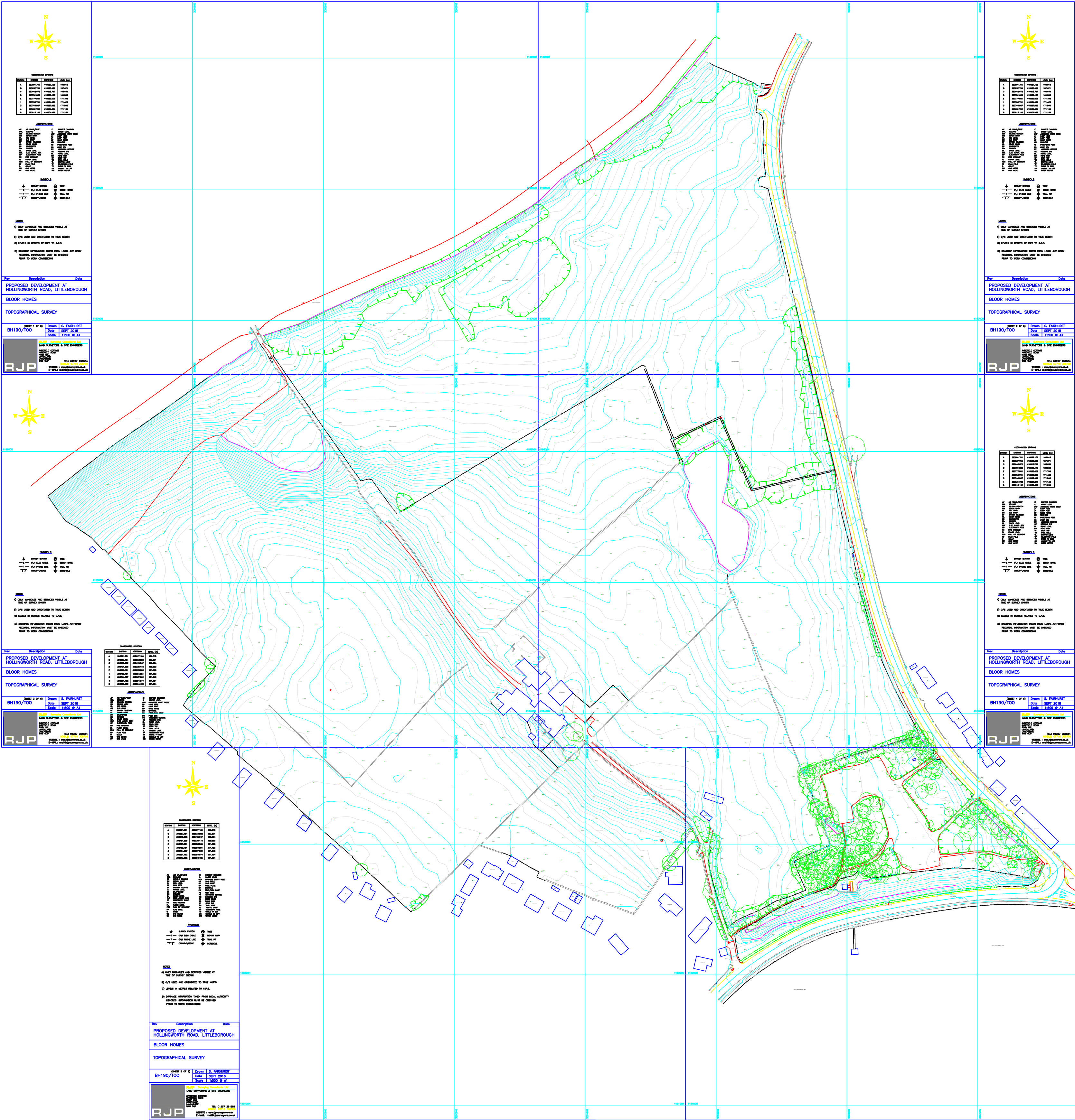
Drawing No. NW111-PD-1002

Hollingworth Rd, Littleborough



APPENDIX G: TOPOGRAPHIC SURVEY

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APPENDIX H: PHOTOGRAPHS

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