



Rochdale SEND School, Heywood

FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY REPORT



10th August 2023

Rochdale SEND School, Heywood

Flood Risk Assessment & Drainage Strategy Report

AJP Ref: 223-018

FS0911-AJP-ZZ-XX-T-C-3000

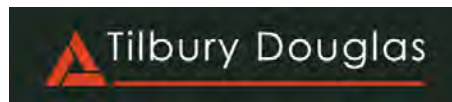
PREPARED BY JOHN SPEERS



Rochdale SEND School, Heywood

Flood Risk Assessment & Drainage Strategy Report

Tilbury Douglas - Rochdale SEND School, Heywood



Record of Approval	Originator:	Approved:	Date:
	J.Speers Associate	P.Bryan Director	10/08/2023
Version	Author:	Change Description:	
P01	J.Speers	Original Issue	26/07/2023
P02	J.Speers	Updated to suit revised surface water outfall location	10/08/2023

Contents

1.0 INTRODUCTION	4
2.0 SITE DESCRIPTION	5
2.1 Geology.....	5
2.2 Hydrogeology	5
2.3 Hydrology	6
3.0 PROPOSED DEVELOPMENT	6
4.0 PLANNING POLICY	6
4.1 Sequential and Exception Test	7
4.2 Exception Test	7
5.0 FORMS OF FLOODING.....	7
5.1 Flooding from Rivers	7
5.2 Flooding from Sea	7
5.3 Flooding from Land.....	7
5.4 Flooding from Groundwater	8
5.5 Flooding from Sewers.....	8
5.6 Flooding from Reservoirs, Canals and Other Artificial Sources	8
6.0 PROPOSED DEVELOPMENT	9
6.1 Effect of Proposed Development	9
6.2 Existing Drainage Systems.....	9
6.3 Proposed Drainage Strategy.....	10
6.3.1 Surface Water Drainage	10
6.3.2 SuDS Summary.....	15
6.3.3 Water Quality Assessment	16
6.3.4 Foul Water Drainage.....	16

7.0 FUTURE MANAGEMENT & MAINTENANCE	18
7.1 General Maintenance & Inspection Requirements.....	18
7.2 Inspection Chambers, Manholes and Catchpits	19
7.3 Pipes	19
7.4 Drainage Channels and Gullies.....	20
7.5 Vortex Flow Control Device.....	20
7.6 Permeable Paving	21
7.7 Cellular Attenuation Tank.....	22
8.0 CONCLUSIONS	23
 Appendix A - Site Location Plan	25
Appendix B - Aerial Photograph	26
Appendix C - Topographic Survey	27
Appendix D - Proposed Site Plan.....	28
Appendix E - Flood Maps	29
Appendix F - United Utilities Sewer Map & Correspondence	30
Appendix G - Pre & Post Development Impermeable Areas Drawing	31
Appendix H - Existing Drainage Information	32
Appendix I - LLFA Correspondence	33
Appendix J - Greenfield Runoff Calculations.....	34
Appendix K - Outline Drainage Strategy Drawing & SW Calculations.....	35



Alan Johnston Partnership Ltd.

Company No. 13204766

Rochdale SEND School, Heywood

Flood Risk Assessment & Drainage Strategy Report

1.0 INTRODUCTION

This Flood Risk Assessment (FRA) and Drainage Strategy Report has been prepared on behalf of Tilbury Douglas in connection with the construction of the new Rochdale SEND School in Heywood, OL10 4TW. The site is situated on the existing Heywood Sports Village site, to the north of West Starkey Street, Heywood. Even though the site is located entirely within Flood Zone 1, the total area of the proposed development is over 1.0ha and therefore an FRA is required.

This FRA has been prepared in accordance with the general requirements of the National Planning Policy Framework and the associated Planning Practice Guidance, both published by the Department for Levelling Up, Housing and Communities. This involves the identification of flood risk to new development(s) on the site, the possible effect of this development on flood risk elsewhere and the investigation of the impact on the development as a result of increased sea levels, fluvial flows and larger pluvial events due to increased impermeable areas and climate change.

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

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

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

In accordance with National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance, flood risk must be assessed for all sources including tidal (from the sea), fluvial (from rivers), pluvial (from land), groundwater, sewer and artificial water bodies (e.g., reservoirs, canals, major water supply infrastructure etc.).

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

The other purpose of this report is to present the surface water and foul water outline drainage strategies for the site which have been developed by the Alan Johnston Partnership.

To demonstrate how the specific drainage requirements are to be met, the report should be read in conjunction with the relevant drawings and supporting information, included within the appendices.

The drainage strategies outlined within this report, have been prepared in accordance with BS EN 752:2017 (Drain and sewer systems outside buildings), Sewers for Adoption, Building Regulations Approved Document H (Drainage and waste disposal), the National Planning Policy Framework document (Department for Levelling Up, Housing and Communities, July 2021) and associated Planning Practice Guidance.



2.0 SITE DESCRIPTION

The proposed development is located on the site of the existing Heywood Sports Village site, to the north of West Starkey Street, Heywood, at National Grid reference SD 85131 11132. The site location is illustrated in Appendix A and the extent of the area to which the application relates is shown on the enclosed aerial photo, attached in Appendix B.

The site generally falls from north-west to south-east, with levels falling from approximately 113.20mAOD in the north-west corner to approximately 111.70mAOD in the south-east corner. The topo and utility survey is attached in Appendix C. The proposed site levels are constrained by the surrounding developments and highway to the south.

2.1 Geology

An intrusive site investigation has been completed by Geotechnics in July 2020, FS0911-GEO-ZZ-XX-T-X-0001. The site investigation indicates that the underlying strata consists of made ground to depths of around 0.90mbgl, which is underlain by deposits of peat, to a maximum recorded depth of 2.60mbgl. This is then underlain by sandy, gravelly clays, to a maximum recorded depth of 12.45mbgl. The bedrock was not encountered during the site investigation works.

This is supported by the information taken from the British Geological Survey (BGS) 1:50,000 Bedrock geology maps. These show that the site has superficial deposits comprising of Devensian Till deposits, with the bedrock reported to be of the Pennine Lower Coal Measures Formation, comprising of mudstone, siltstone and sandstone.

2.2 Hydrogeology

The Environment Agency groundwater maps show that the superficial deposits are classified as Secondary undifferentiated strata. These are defined as areas where it has not been possible to attribute either category A or B to a rock type, respectively. In most cases this is due to the variable characteristics of the rock type.

The bedrock is classified as a Secondary A Aquifer, defined as permeable layers that can support local water supplies, and may form an important source of base flow to rivers.

The Environment Agency groundwater maps also indicate that the development site is not situated within a groundwater Source Protection Zone (SPZ).

Groundwater was encountered within the exploratory holes undertaken within the Geotechnics Ground Investigation Report, FS0911-GEO-ZZ-XX-T-X-0001. Groundwater monitoring was undertaken, with groundwater levels recorded between 9.6mbgl - 9.9mbgl. Therefore, it is concluded that the groundwater is located at depth.

2.3 Hydrology

The site is located within Flood Zone 1 which is categorized by the Environment Agency as land assessed as having less than a 1 in 1,000 annual probability of river flooding (1% - 0.1%). Therefore, the site is an area identified by the Environment Agency as at low risk of flooding from rivers and streams.

3.0 PROPOSED DEVELOPMENT

The proposed development site covers a total area of 1.264ha and currently consists of an existing grassed/landscaped field. Previously the development site consisted of a sports pitch, associated with the adjacent Heywood Sports Village but this has since been left to overgrow and is not currently used as a sports pitch.

The proposed development is to construct a new two storey main school building with accompanying car park, access roads, hardstanding areas and also hard and soft play areas.

To enable a viable scheme, the proposed site levels are constrained by the existing developments and highways surrounding the site, therefore the site levels may be amended but are likely to remain similar to the existing in order to tie into the surrounding developments and highway. A proposed site plan is attached in Appendix D.

4.0 PLANNING POLICY

The National Planning Policy Framework (NPPF) sets out the Government's policy on meeting the challenges of climate change, flooding and coastal change. The NPPF states that:

"Planning plays a key role in helping shape places to secure radical reductions in greenhouse gas emissions, minimising vulnerability and providing resilience to the impact of climate change, and supporting the delivery of renewable and low carbon energy and associated infrastructure. This is central to the economic, social and environmental dimensions of sustainable development. Local planning authorities should adopt proactive strategies to mitigate and adapt to climate change taking full account of flood risk, coastal change and water supply and demand consideration."

This Flood Risk Assessment proposes recommendations to facilitate the proposed development so that it takes into account flood risk at all stages of the development.

4.1 Sequential and Exception Test

Based on the sites location in Flood Zone 1, the development is deemed appropriate according to NPPF therefore the development is appropriately situated and the Sequential Test is not required.

4.2 Exception Test

NPPF classifies the development (Schools) as 'More Vulnerable' but as the site is located within Flood Zone 1 the Exception Test is not required.



5.0 FORMS OF FLOODING

The National Planning Policy Framework requires all forms of flooding to be considered.

5.1 Flooding from Rivers

The Flood Risk map is included as Appendix E.

As can be seen from the Flood Risk map, the entire site is located within Flood Zone 1 and therefore, the site is located in Flood Zone 1 with a chance of flooding of less than 0.1% (or 1 in 1000).

The nearest designated main river is the River Roch, which is located 340m to the north-west of the site. Given the distance between the site and the brook, the risk of flooding to the new development from rivers is considered to be low.

5.2 Flooding from Sea

The site is not at risk of flooding from the sea. The lowest level of the site is approximately 111.70mAOD, i.e., well above tidal flood levels.

5.3 Flooding from Land

Intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems can run quickly off land and result in local flooding. The Surface Water Flooding map is included in Appendix E. It can be seen from the map that all areas of the site are classified as having a low or very low risk of surface water flooding.

Therefore, the risk of flooding from overland flows due to surface water flooding is considered to be low and as such the overall site is considered to be at low risk of flooding from surface water/surrounding land.

5.4 Flooding from Groundwater

As outlined in Section 2.2, groundwater was encountered within the exploratory holes undertaken within the Geotechnics Ground Investigation Report, FS0911-GEO-ZZ-XX-T-X-0001. However, groundwater monitoring has been undertaken and this indicates that the groundwater levels are between 9.6mbgl - 9.9mbgl. Therefore, it is concluded that the groundwater is located at depth.

As such, due to the depth of the groundwater encountered during the intrusive ground investigation works, the site is considered to be at low risk of flooding from groundwater.

5.5 Flooding from Sewers

A record of Public Sewers surrounding and serving the development site has been obtained from United Utilities and this is included in Appendix F. As can be seen from the United Utilities sewer map, there are no public sewers located within the site boundary. The only nearby public sewers are located within the existing highway to the south and the surrounding residential developments to the north and west of the site.

Therefore, due to the lack of public sewers within the proposed site; the fact that the proposed private drainage networks for the site are being suitably designed; and the fact that the public sewers are maintained by United Utilities and private drainage will be maintained by the school or an on-site facilities management team, leads to the conclusion that the site itself is considered to have a low risk of flooding from sewers.

5.6 Flooding from Reservoirs, Canals and Other Artificial Sources

The Reservoir Flood Risk map is included in Appendix E and the closest artificial waterbody is the Boating Lake which is located 910m north-east of the site. The nearest reservoir is Greenbooth Reservoir which is located approximately 4.05km north of the site.

As such, it can be seen from the map that the site is not at risk of flooding from reservoirs, canals or other artificial sources.



6.0 PROPOSED DEVELOPMENT

6.1 Effect of Proposed Development

As previously outlined in Section 2.0, the existing site covers a total area of 1.264ha. The pre and post development impermeable areas for the 1.264ha development area have been assessed and are indicated on the attached drawing in Appendix G. The comparison between the pre and post development impermeable areas is also summarised below;

Total Development Site Area (ha)	Existing Impermeable Area (ha)	Proposed Impermeable Area (ha)
1.264	0.000	0.591

Therefore, the changes to the existing site will increase the volume of impermeable areas and as such, the proposed development will lead to an increase in the;

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

As such, drainage systems are needed to drain the foul and surface water flows arising from the proposed development. Where possible, any existing drainage networks should be utilised. Appropriate design and construction of these systems as set out in Section 6.3 should ensure that there is no increase in offsite flood risk that would otherwise impact downstream areas.

6.2 Existing Drainage Systems

As can be seen from the United Utilities public sewer map, attached in Appendix F, there are no public sewers located within the site boundary. While the United Utilities sewer map indicates that there is a public surface water sewer located to the west of the site, discussions with United utilities have confirmed that this is actually a public combined water sewer. The UU correspondence is attached in Appendix F.

Therefore, the only nearby public sewers are combined water sewers located to the south and west of the site. This is confirmed via the existing topo and utility survey, attached in Appendix C, which indicates that there are no existing public sewers located within the proposed site, with very minimal existing drainage located within the proposed development site.

The only private drainage located within the proposed site, is the existing surface water drainage located along the northern boundary. This is confirmed via the Drain Alert CCTV survey FS0911-DRA-XX-XX-T-U-0001-P01 dated December 2019, which is attached in Appendix H.

The existing drainage information attached in Appendix H, includes a proposed drainage layout drawing for the site from 2009 and this shows that the former sports field at the

proposed site included a pitch drainage system comprising a network of 80mm diameter porous pipes draining to a surface water pumping station, into which all other sports pitches on the Heywood Sports Village drain.

The proposed drawing states that the surface water rising main from the pumping station discharges into a United Utilities combined sewer overflow which then discharges to the River Roch. Further information is provided in the report from United Utilities Total Solutions from May 2015 where the discharge from the pumping station was traced.

This concludes that the pumping station includes an attenuation tank and is located east of the sports village buildings, which contradicts the 2009 proposed building which shows no attenuation tank and the pumping station located to the west of the sports village building.

The tracing report concludes that the discharge from the pumping station discharges to the River Roch but has no connectivity to any United Utilities assets. The 2009 proposed drainage layout for the site shows surface water from the sports village building and car park, along with the foul water connecting into a United Utilities 1000mm x 500mm brick culvert on West Starkey Street.

The Drain Alert CCTV survey FS0911-DRA-XX-XX-T-U-0001-P01, attached in Appendix H, indicates that the private surface water manhole located to the north-east corner of the site is not a pump chamber/pump station and this therefore corresponds with the United Utilities Total Solutions information from May 2015.

6.3 Proposed Drainage Strategy

As outlined above in section 6.1, site-wide drainage systems are required to drain the foul and surface water flows arising from the proposed development. The proposed drainage systems must ensure that there is no increase in offsite flood risk that would otherwise impact downstream areas.

6.3.1 Surface Water Drainage

The Planning Policy Guidance and the CIRIA SuDS Manual detail that surface water runoff from a development should be disposed of as high up the following hierarchy as reasonable practicable:

- ◆ into the ground (infiltration);
- ◆ to a surface water body;
- ◆ to a surface water sewer, highway drain, or another drainage system;
- ◆ to a combined sewer.

Considering the hierarchy above, the surface water network should infiltrate where possible. An intrusive site investigation was completed by Geotechnics and is contained within the Geotechnics Ground Investigation Report, FS0911-GEO-ZZ-XX-T-X-0001.

The Geotechnics Ground Investigation Report, FS0911-GEO-ZZ-XX-T-X-0001 indicates that the site is underlain by peat, which is then underlain by clays. The presence of the peat

stratum would preclude the use of infiltration across the site as this could lead to inundation settlement issues.

As the possibility of infiltration has been ruled out by the site investigation, the intention for the development would be to discharge to watercourse. The nearest watercourse is the River Roch, which is located approximately 340m to the north-west of the site. Due to the distance through existing third-party residential land, discharging directly into the watercourse has been deemed as impractical.

As previously indicated, there are no public surface water sewers with the only nearby public sewers being combined water sewers. However, as outlined within Section 6.2, there is an existing private surface water drain located just outside the northern boundary of the site. As such, it is anticipated that the surface water runoff from the proposed development will discharge into this existing private surface water sewer.

As outlined in Section 6.2, there is contradicting information regarding the existing private surface water drain to the north of the site. The contradicting information is attached in Appendix H. The proposed drainage layout drawing for the site from 2009 shows the site draining to a surface water pumping station, into which all other sports pitches on the Heywood Sports Village drain. The proposed drawing indicates that the surface water rising main from the pumping station discharges into a United Utilities combined sewer overflow.

The contradicting information is provided in the report from United Utilities Total Solutions from May 2015, where the discharge from the pumping station was traced. This concludes that the discharge from the pumping station and therefore private surface water drainage to the north of the site, discharges to the River Roch but has no connectivity to any United Utilities assets

The Drain Alert CCTV survey FS0911-DRA-XX-XX-T-U-0001-P01, attached in Appendix H, indicates that the private surface water drainage located to the north of the site is fairly shallow, with a depth of around 1.5m.

Given the topography of the site falls from north-west to south-east and the shallow depth of the existing private surface water drainage to the north of the site, the proposed surface water drainage from the development would require pumping in order to discharge into the existing private surface water drainage to the north of the site.

Due to the contradictory information providing uncertainty as to where the existing private surface water drainage to the north of the site actually discharges and the sustainability and maintenance issues associated with pumping surface water, the LLFA and United Utilities have been contacted regarding the possibility of discharging the surface water runoff from the site into the existing public combined water sewers.

The correspondence with the LLFA is attached in Appendix I, and as can be seen the LLFA have indicated that from a sustainability perspective they would prefer the surface water runoff from the proposed development to discharge via gravity into the surrounding public combined water sewers, to avoid the need for pumping.

The pre development enquiry response from United Utilities is attached in Appendix F, and this indicates that United Utilities would accept surface water runoff from the development into the public combined water sewer but only if other options have been discounted. Therefore, United Utilities have been contacted to confirm if they agree with the LLFA comments and a response has been received. This correspondence is also attached in Appendix F.

The United Utilities response indicates that they also believe that due to the contradictory information regarding the existing private surface water drainage and also the sustainability issues associated with pumping surface water runoff, they believe that the best option is to discharge the surface water runoff from the site into the public combined water sewer at a maximum discharge rate of 5.0 L/s.

As such, it is concluded that the proposed surface water drainage from the proposed development should discharge into the existing public combined water sewer to the west of the site. This is to ensure compliance with the LLFA and United Utilities requirements.

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

Where possible, the new surface water drainage system should be designed in line with Sewers for Adoption (8th Edition), with the requirements for the design of a new surface water drainage systems are as follows:

- ◆ Below ground piped drainage to be sized to accommodate the 1 in 2 year (50% AEP) design storm without surcharge.
- ◆ System to be designed not to flood any part of the site in a 1 in 30 year (3% AEP) design storm.
- ◆ For events in exceedance of the 1 in 30 year design storm and up to and including the 1 in 100 year event, site drainage and topography should be designed where practicable to route surface water run-off away from buildings to safe above-ground storage areas on site, thereby preventing this run-off from leaving the site and increasing flood risk elsewhere.

For each design case described above, the design storm is the critical storm duration for the site conditions. In the case of the 1 in 100 year design storm, a 45% increase in the peak rainfall intensity is applied to allow for the estimated worst case impacts of climate change. This is in accordance with advice, issued by the Environment Agency, which updates previous climate change allowances outlined in the National Planning Policy Framework.

Suitable systems of below ground drainage will be required to contain as a minimum requirement, the 1 in 30 year event. Additionally, any surface water run-off from events that exceed the design capacity of the new drainage system, up to and including the 1 in 100 year (+45%) event, will be retained on-site in safe storage areas.

In line with common practice, it is proposed the surface water discharge from the proposed development should mimic that from the existing site.

As the existing site is greenfield, the proposed surface water runoff rates are to be restricted to a discharge rate which is as close as reasonably practicable to the existing greenfield run off rates for the site.

Therefore, an assessment of the existing surface water run-off from the greenfield site has been completed using the ICP SuDS method within Micro Drainage. Using only the 0.591ha of impermeable area across the proposed site, the existing greenfield run-off rates were calculated. The greenfield runoff assessment is attached in Appendix J and the results are summarised within the table below.

Rainfall Return Period (years)	Existing Greenfield Runoff Rate (L/s)
Qbar (2 Year)	4.5
30 year	7.7
100 year	9.4

As can be seen from the existing greenfield runoff rates above, the greenfield runoff rates are less than the maximum discharge restriction of 5.0 L/s. This discharge restriction is generally accepted as the minimum discharge rate to avoid the need for very small orifices, which due to their minimal size are prone to blockage. The 5.0 L/s discharge rate is in compliance with the Environment Agency document; '*Rainfall runoff management for developers*', Report SC030219.

This is supported by United Utilities, as the guidance notes within the United Utilities Section 104 adoption agreement states that for any flow control device, "*The minimum acceptable orifice size is 100mm.*" and to achieve this minimum orifice diameter a maximum discharge rate of 5.0 L/s is required.

This is further supported by the correspondence from United Utilities which is attached in Appendix F, as this indicates that United Utilities have imposed a maximum surface water discharge restriction of 5.0 L/s to the public combined water sewer to the west of the site.

Therefore, the maximum surface water discharge rate for the site should be 5.0 L/s as this would minimise the blockage risks, previously outlined above. As such, the surface water drainage system is to be designed to restrict the discharge to 5.0 L/s, for all rainfall events up to and including a 1 in 100 year return period + 45% climate change design storm.

As seen in the Outline Drainage Strategy Drawing attached in Appendix K, the attenuation storage will be provided in the form of a cellular attenuation tank, the granular drainage blanket below the areas of permeable paving and also the surface water drainage network itself, with a vortex flow control device used to restrict the discharge rate to the required 5.0 L/s discharge rate, indicated above.

The surface water drainage calculations have also been included within Appendix K and as can be seen the proposed surface water drainage and attenuation storage prevent any flooding for all rainfall events up to and including the 1 in 100 year + 45% climate change event and also meet the discharge restriction above. This is summarised in the table below.

Rainfall Return Period (years)	Existing Greenfield Runoff Rate (L/s)	Proposed Discharge Rate (L/s)
Qbar (2 Year)	4.5	4.8
30 year	7.7	4.8
100 year	9.4	5.0

The proposed surface water drainage calculations are attached in Appendix K and as can be seen from the results the surcharged runoff is to be stored using a 319.2m³ below ground cellular attenuation tank, with the remaining surcharged runoff stored within the granular drainage blanket below the areas of permeable paving and also the proposed surface water drainage network itself.

This is confirmed via the proposed surface water drainage calculations, attached in Appendix K, which indicate that there is no flooding for all rainfall events up to and including the 1 in 100 year +45% climate change event.

As can be seen from the Outline Drainage Strategy Drawing attached in Appendix K, the surface water drainage collects the runoff from the site area via permeable paving, porous tarmac, gullies, linear drainage channels and rainwater downpipes and conveys the surface water runoff to the west of the proposed site.

Here the surface water runoff is restricted via a vortex flow control device prior to combining with the foul water discharge from the proposed development. This then discharges into the existing public combined water sewer to the west of the site. The vortex flow control device restricts the surface water runoff to the required 5.0 L/s discharge rate, for all rainfall events up to and including the 1 in 100 year +45% climate change event.

Due to parts of the car parks not being drained via permeable paving and the service yard/delivery area to the east of the building, an oil separator has been incorporated within the proposed surface water drainage network. To comply with Guidance for Pollution Prevention (GPP) 3 a class 1 by-pass separator has been proposed.

A Section 106 agreement with United Utilities will be required to ensure acceptance of the proposed connection to the existing public combined water sewer to the west of the site.

6.3.2 SuDS Summary

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

SuDS Technique	Suitable for This Development?	Reasoning
Green Roof	✗	Unsuitable due to lack of available space on roof area.
Rainwater Harvesting	✓	Impractical on large scale due to lack of demand for greywater but water butts possible and incorporated.
Basins, Ponds & Swales	✗	Unsuitable due to topography of site, lack of available space to north of site and vulnerable nature of end user.
Filter Strips	✗	Unsuitable due to topography of site and lack of available areas to incorporate.
Bio-retention Areas	✗	Unsuitable due to topography of the site and lack of available areas to incorporate.
Infiltration Techniques	✗	Unsuitable due to peat stratum and underlying impermeable strata.
Permeable Surfaces	✓	Only non-infiltration permeable surfaces suitable and incorporated where possible.
Tanked/Piped Systems	✓	Suitable and incorporated.

Green roof areas were considered but the majority of the roof areas are covered by plant equipment and photovoltaic (PV) panels. Therefore, due to a lack of available space on the proposed roof areas the use of green roof areas has been discounted.

Rainwater harvesting was also considered but due to a lack of greywater demand and the cost associated with tanks and pumping of the separate system, it has been deemed as impractical to include a rainwater harvesting system. However, the use of water butts on the rainwater downpipes closest to the proposed orchard/raised planter boxes have been incorporated to ensure some form of rainwater harvesting is incorporated across the site.

Due to the topography of the site, the lack of available space to the north of the site and also the vulnerable nature of the end user (SEND school), the use of a pond, detention basin or swale would not be suitable for the proposed site.

Filter drains/strips and bio-retention areas were also considered but due to the site topography falling in the opposite direction to the proposed outfall location and a lack of available areas, filter drains/strips and bio-retention areas have not been included.

As previously discussed infiltration is not feasible across the site and therefore the use of infiltration SuDS techniques is not possible. Despite this, the use of non-infiltration permeable surfaces such as permeable paving/porous tarmac has been incorporated and included where possible across the site.

Finally, the use of below ground cellular attenuation tanks and oversized pipe networks is suitable and is therefore incorporated, where required. As indicated within the Outline Drainage Strategy Drawing attached in Appendix K, a below ground cellular attenuation tank has been incorporated below the proposed car park area to the west of the site.

6.3.3 Water Quality Assessment

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

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

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

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

Assessing this against Table 26.3 of CIRIA Report C753 - The SuDS Manual using the permeable paving/porous tarmac SuDS solution, results in the mitigation indices outweighing the pollution hazard indices identified above. The use of permeable paving/porous tarmac itself results in mitigation indices of; TSS - 0.7, Metals - 0.6 and Hydrocarbons - 0.7, which is sufficient.

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

6.3.4 Foul Water Drainage

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

1. Public sewer
2. Septic tank
3. Cesspool

The foul water system shall be designed in accordance with;

- ◆ BS EN 752:2017 (Drain and sewer systems outside buildings)
- ◆ Sewers for Adoption (8th Edition)
- ◆ Planning Practice Guidance and the National Planning Policy Framework document (Department for Levelling Up, Housing and Communities, July 2021).
- ◆ BS EN 12056-2:2000 (Drainage systems inside buildings)

- ◆ Building Regulations Approved Document H, Drainage and waste disposal. (Office of the Deputy Prime Minister, December 2015).

As can be seen from the Outline Drainage Strategy Drawing attached in Appendix K, the foul water drainage will collect run off from the proposed building and convey the foul water to the west of the proposed site.

Here it will combine with the restricted surface water runoff, prior to discharging into the existing public combined water sewer located in the small walkway between Cedar Avenue and the western boundary of the site. The proposed connection is a via a new connection to the existing public combined water sewer.

The existing private foul water drainage will discharge, at unrestricted discharge rates, into the existing 225mm diameter public combined water sewer, located in the small walkway between Cedar Avenue and the western boundary of the site.

As outlined within Section 6.2, the United Utilities sewer map indicates that there is a public surface water sewer located to the west of the site, but discussions with United Utilities have confirmed that this is actually a public combined water sewer. The UU correspondence is attached in Appendix F.

A Section 106 connection agreement is required from United Utilities, to ensure acceptance of the proposed connection to the existing public combined water sewer.



7.0 FUTURE MANAGEMENT & MAINTENANCE

The proposed drainage solution uses SUDS techniques in accordance with the CIRIA SUDS Manual C753. The surface water run-off from the proposed development is restricted using a vortex flow control device and the attenuated run-off is stored using a below ground cellular attenuation tank.

The following components have been or will be included within the drainage strategy for the proposed development:

- ◆ Inspection chambers, manholes and catchpits.
- ◆ Pipes.
- ◆ Drainage channels and gullies.
- ◆ Vortex flow control device.
- ◆ Permeable paving/porous tarmac.
- ◆ Cellular attenuation tank.

A suitable maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented. The proposed drainage is to remain private and therefore maintenance of the surface and foul water drainage systems will be the responsibility of Rochdale SEND School or an on-site facilities management team and therefore a copy of the final construction drainage layout should be provided in the final Operations and Maintenance Manual.

As such, the maintenance of the specified SuDS should be included within the developments Operation and Maintenance Manual and should be detailed in accordance with the CIRIA SuDS Manual C753, as per the operation and maintenance guidance outlined below.

7.1 General Maintenance & Inspection Requirements

- ◆ No work shall be carried out on the drainage system without permission from a nominated person, who has access to information/a working knowledge of the system.
- ◆ Maintenance/inspection work shall be carried out in a safe/planned manner.
- ◆ All work is to be carried out by competent persons suitably trained and equipped in accordance with current statutory safe working policies.
- ◆ Entry into confined spaces shall be kept to a minimum and be restricted to suitably qualified/equipped persons working in accordance with current statutory safe working policies.
- ◆ Drainage systems shall be inspected on a regular basis or should any problems be suspected. Any debris/defects discovered shall be recorded and a programme of cleaning/ repair initiated. Urgent repairs/cleaning shall be actioned as soon as practicable.
- ◆ It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event.
- ◆ Clearing of the drainage system can be achieved by a number of methods depending on the nature of the work;
 - Rodding - Manual/Mechanical with flexible rods.
 - Jetting - High pressure water jetting.
 - Plunging.

7.2 Inspection Chambers, Manholes and Catchpits

The appropriate health and safety equipment must be used when accessing manholes/catchpits. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Maintenance Manager prior to any access. The following operations should be carried out annually.

- ◆ Covers of inspection chambers and manholes shall be removed and the sides, benchings and channels cleared.
- ◆ Accumulated deposits of silt in inspection chambers, catchpits and manholes shall be removed. Any traps shall then be plunged and thoroughly flushed out with clean water. This should be completed in Autumn, after leaf fall.
- ◆ Main and branch drains shall be cleared as required and afterwards be flushed with clean water. Any obstructions found shall be removed and not flushed down the system.
- ◆ Covers of inspection chambers, manholes and catchpits shall be replaced, bedded in suitable grease or other sealing material as required and bolted/locked down as appropriate. Missing bolts and broken items shall be replaced in accordance with the manufacturer's details.

7.3 Pipes

Regular inspection and maintenance are important to identify areas which may have become obstructed/clogged and may not be draining correctly, as failure to do so would expose the development to a greater level of flood risk.

Pipes are proprietary products and therefore the materials used can vary across the site. As such, where used the manufacturer's recommendations should be followed. Access for maintenance of the pipes is provided through inspection chambers and manholes. The below table sets out the maintenance schedule for the pipe components of the proposed drainage systems.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect for evidence of poor operation via water levels. If required take remedial action.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.
	Check and remove large debris and/or vegetation growth near pipe runs.	Monthly or as required.
Remedial Actions	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue.	As required, if above actions do not improve performance.
Monitoring	Initial Inspection should be provided as post construction CCTV survey.	N/A
	Inspect/check all inlets, outlets and overflows to ensure they are in good condition and operating as designed.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.

7.4 Drainage Channels and Gullies

Channels and gullies should be inspected and cleaned in accordance with the manufacturer's details. Channel units can be cleaned through the use of a high-pressure hose; this can be fed into the channel system through access units strategically placed along the channel run. The throat section of channel units should be kept clear at all times to ensure uninterrupted flow of surface water into the drainage channel and any debris within the throat should be removed.

Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers are allowed to move within their frame, this may cause damage to the frame or seating. The below table sets out the maintenance schedule for the drainage channel and gullies components of the proposed drainage systems.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Litter and debris removal.	Monthly or as required.
	Check and remove large debris and/or vegetation growth near pipe runs.	Monthly or as required.
	Inspect for evidence of poor operation and/or weed growth. If required take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.
Remedial Actions	Inspect access/outlet boxes and rod through poorly performing channels and outlets as initial remediation.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue.	As required, if above actions do not improve performance.
Monitoring	Initial Inspection including channel outlet boxes and gully sumps.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.

7.5 Vortex Flow Control Device

Regular inspection and maintenance is important to identify if the vortex flow control device has become obstructed/clogged and may not be functioning correctly, as failure to do so would expose the development to a greater level of flood risk.

Vortex flow control devices are proprietary products and therefore can vary from manufacturer to manufacturer. As such, where used the manufacturer's recommendations should be followed.

- ◆ Normally, little maintenance is required as there are generally a vortex flow control device has no moving parts.
- ◆ If blockages occur, they tend to do so at the intake of the vortex flow control device.
- ◆ Vortex flow control devices are generally fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur.
- ◆ The smaller type conical units, below the minimum recommended size, are also supplied with rodding facilities or vortex suppressor pipes as standard.

- Following installation of the vortex flow control device it is vitally important that any extraneous material i.e., Building materials are removed from the unit and the chamber.
- After the system is made live, it is recommended that each unit be inspected monthly for three months and thereafter at six monthly intervals with hose down if required. Units should also be inspected within 48 hours after large storms.

7.6 Permeable Paving

The maintenance requirements for permeable paving is covered under the previous pavements section within the CIRIA SUDS Manual C753. As such, the maintenance requirements for permeable paving are outlined within Table 20.15 of the CIRIA SUDS Manual C753. An extract of that table is given below to set out the maintenance schedule for the permeable/porous tarmac component of the proposed drainage systems.

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

7.7 Cellular Attenuation Tank

Regular inspection and maintenance is important to identify if the inlets/outlets have become obstructed/clogged and may not be functioning correctly, as failure to do so would expose the development to a greater level of flood risk.

The maintenance requirements for cellular attenuation tanks are outlined within Table 21.3 of the CIRIA SUDS Manual C753. An extract of that table is given below to set out the maintenance schedule for the cellular attenuation tank component of the proposed drainage systems.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

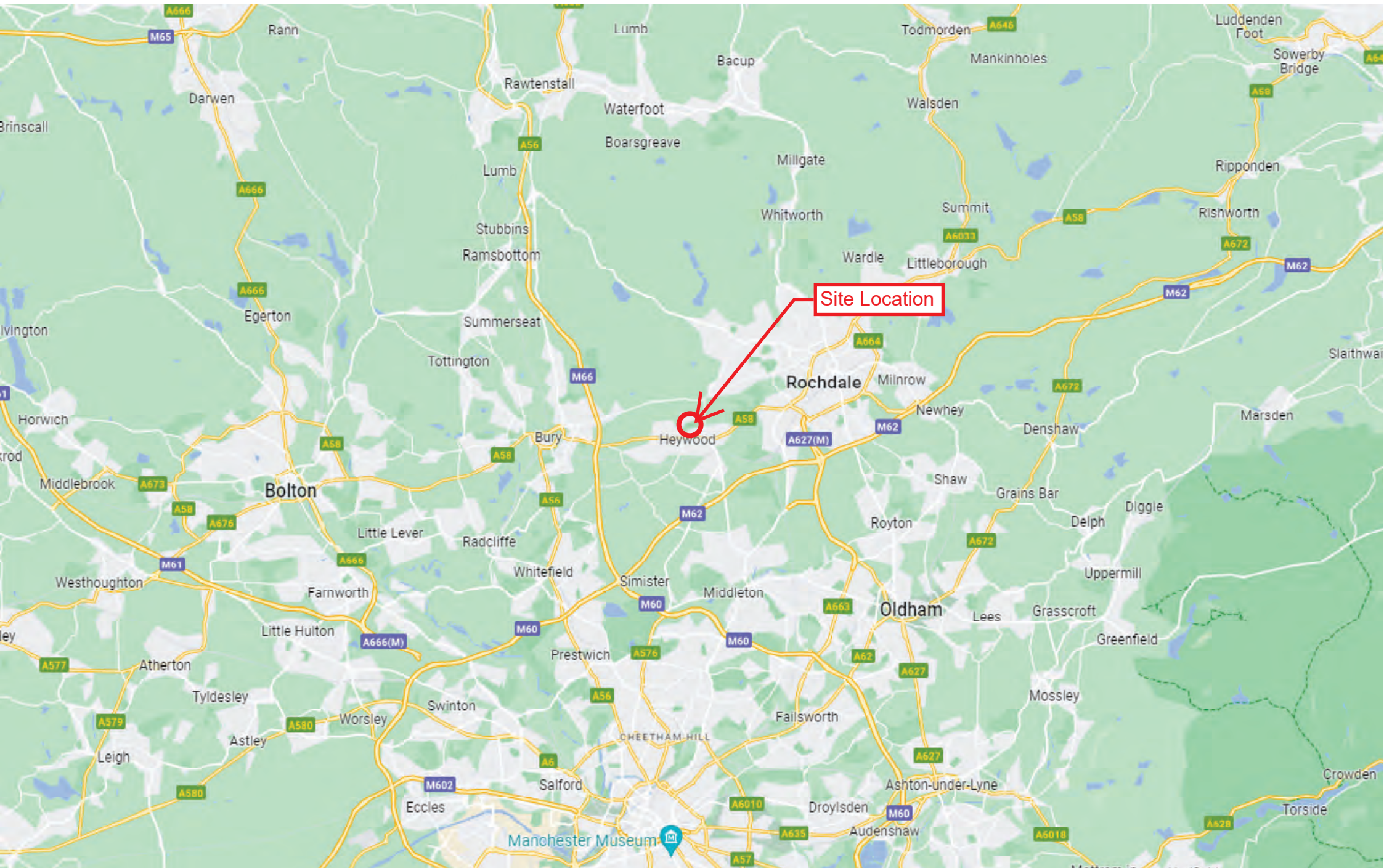
8.0 CONCLUSIONS

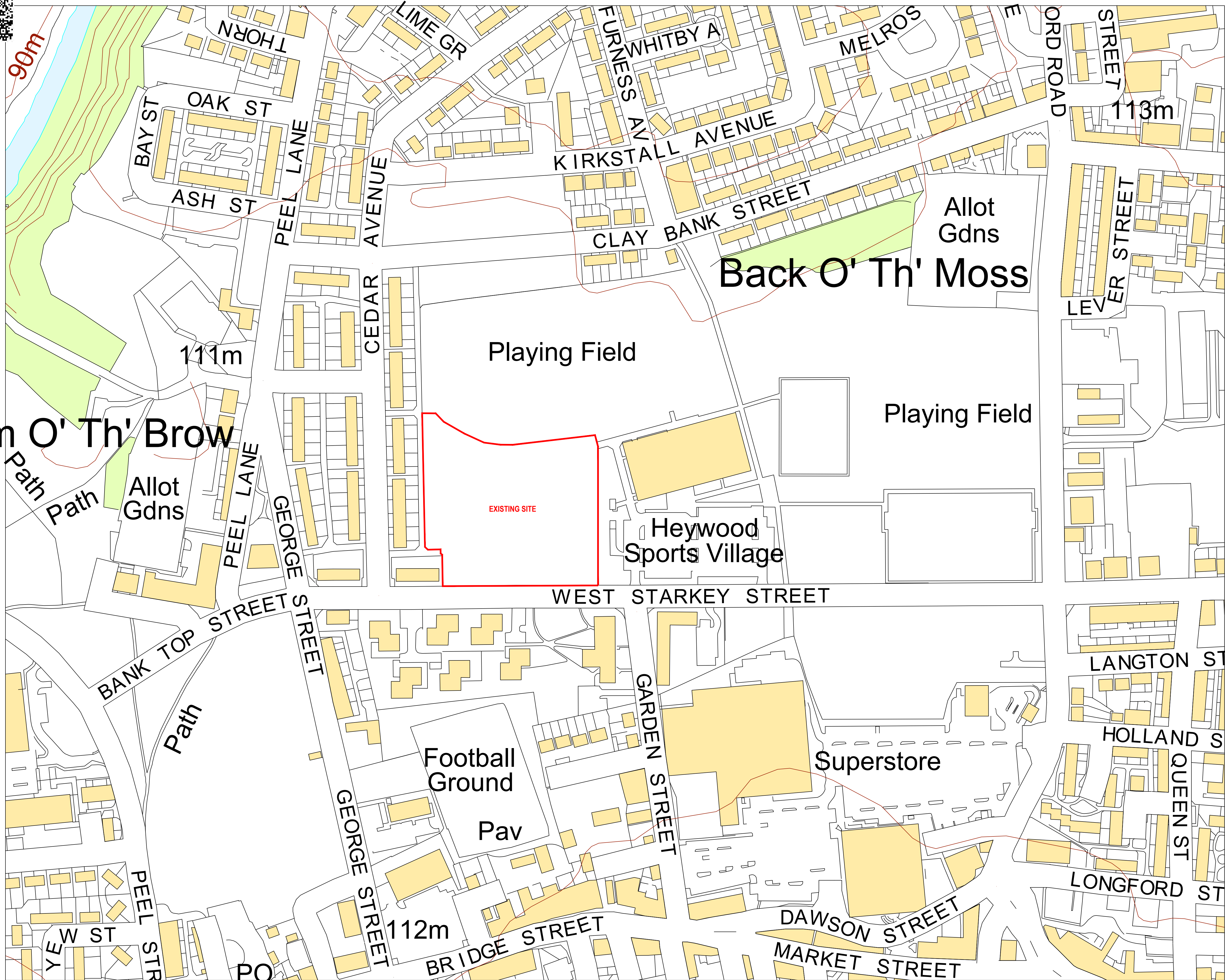
- ◆ The site is located within Flood Zone 1 and has a low risk of flooding from rivers & sea, surface water, reservoirs and all other sources. Therefore, due to the low risk of flooding from all sources, no flood risk mitigation measures are required for the proposed development.
- ◆ The United Utilities sewer map indicates that there is a public surface water sewer located to the west of the site but discussions with United Utilities have confirmed that this is actually a public combined water sewer.
- ◆ Therefore, there are no existing public sewers located within the proposed site, with the only nearby public sewers being the combined water sewers located to the south and west of the site.
- ◆ The only private drainage located within the proposed site, is the existing surface water drainage located along the northern boundary. This is confirmed via the Drain Alert CCTV survey FS0911-DRA-XX-XX-T-U-0001-P01 dated December 2019.
- ◆ The site investigation report indicates that the underlying strata consists of peat, which is then underlain by clays. The presence of the peat stratum precludes the use of infiltration across the site, as this could lead to inundation settlement issues.
- ◆ Given the topography of the site falls from north-west to south-east and the shallow depth of the existing private surface water drainage to the north of the site, the proposed surface water drainage from the development would require pumping in order to discharge into the existing private surface water drainage to the north of the site.
- ◆ Due to the contradictory information providing uncertainty as to where the existing private surface water drainage to the north of the site actually discharges and the sustainability and maintenance issues associated with pumping surface water, the LLFA and United Utilities have been contacted regarding the possibility of discharging the surface water runoff from the site into the existing public combined water sewers.
- ◆ The LLFA and United Utilities have both indicated that they would prefer the surface water runoff from the proposed development to discharge via gravity into the surrounding public combined water sewers, to avoid the need for pumping.
- ◆ Therefore, as there are no nearby public surface water sewers, it is anticipated that the surface water runoff from the proposed development will discharge into the existing 225mm diameter public combined water sewer, located in the small walkway between Cedar Avenue and the western boundary of the site.

- ◆ As the existing site is greenfield, the proposed surface water runoff rates are to be restricted to a discharge rate which is as close as reasonably practicable to the existing greenfield run off rates for the site. This should be applied to all rainfall events up to and including the 1 in 100 year +45% climate change event.
- ◆ The surface water drainage will collect the runoff from the proposed development and convey it to the west of the site. Here it will be restricted to the minimum discharge rate of 5.0 L/s, as this would minimise the blockage risks and also comply with the LLFA and United Utilities requirements.
- ◆ The surface water runoff will be restricted via a vortex flow control device prior to combining with the foul water discharge from the proposed development. This then discharges into the existing public combined water sewer to the west of the site.
- ◆ A below ground cellular attenuation tank, together with the granular drainage blanket below the areas of permeable paving and the surface water drainage network itself will be used to attenuate the surcharged surface water runoff.
- ◆ The foul water drainage will collect the runoff from the proposed building and convey the foul water to the west of the proposed site. Here it will combine with the restricted surface water runoff prior to discharging into the existing 225mm diameter public combined water sewer, located in the small walkway between Cedar Avenue and the western boundary of the site.
- ◆ A Section 106 connection agreement is required from United Utilities, to ensure acceptance of the proposed combined water connection to the existing public combined water sewer.
- ◆ The external ground levels around proposed buildings shall fall away from the proposed building with any new levels being designed to ensure any overland flood routes, for events in excess of the 100 Year + 45% CC, exit towards the surrounding highways and greenfield areas, for use in exceptional circumstances.



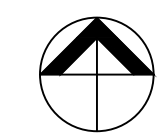
Appendix A – Site Location Plan





Ordnance Survey, (c) Crown Copyright 2021. All rights reserved. Licence number 100022432

SCALE 0 12.5 25 50 75 100 125



NOTES

Copyright: All rights reserved. This drawing must not be reproduced without permission. This drawing must not be scaled. Dimensions are in millimetres unless specified.

Rev	Date	Notes	By	Chk
P1	12.06.23	Page 2 Issue	JH	AS

elliswilliams

Project Number: 2718
Project Name: FS0911 Rochdale SEND

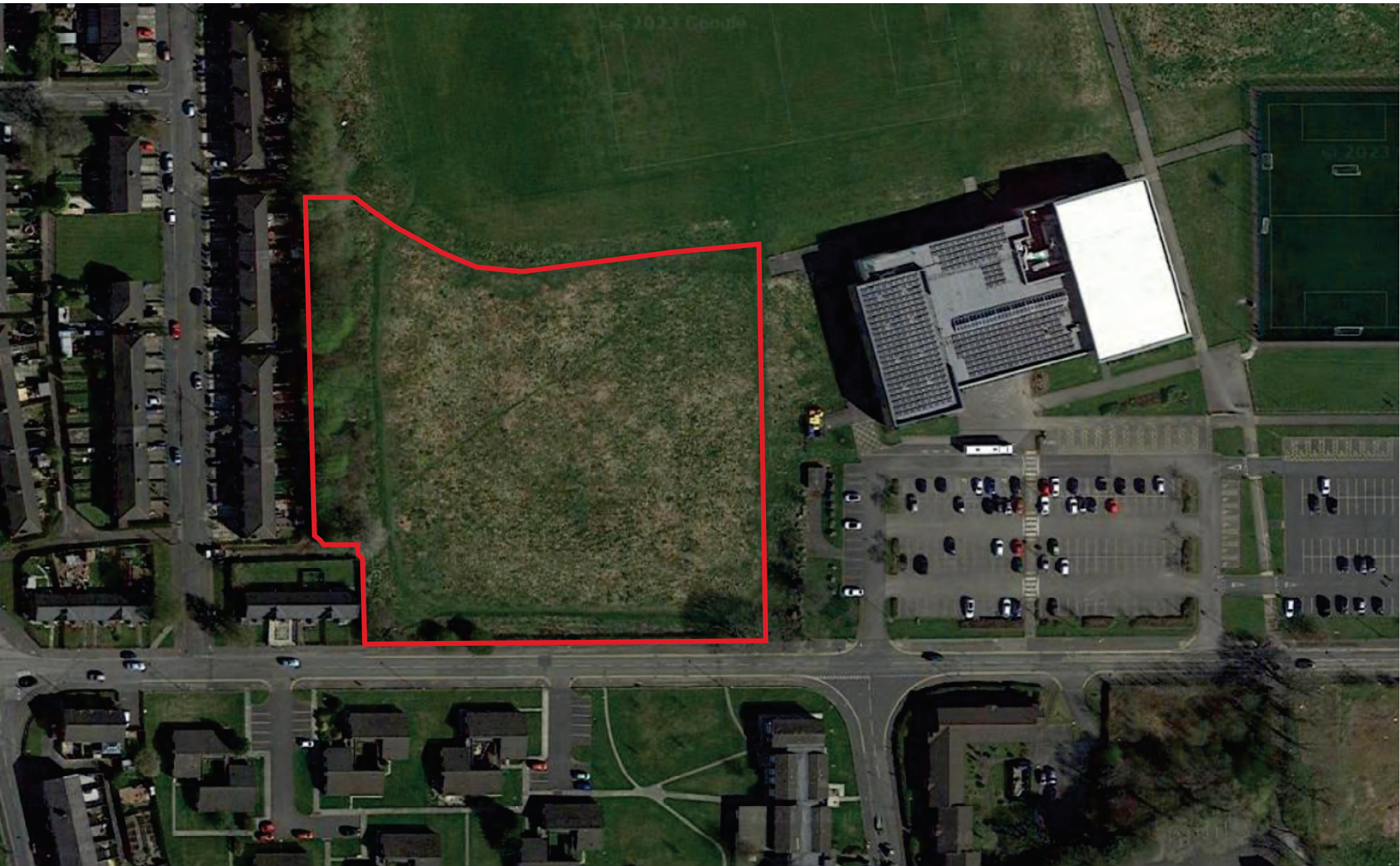
Drawing Status: S3
Drawing Number: **FS0911-EWA-ZZ-ZZ-D-A-9002**
Drawing Name: Site Location Plan

Date: 12.06.23
Drawn By: JH

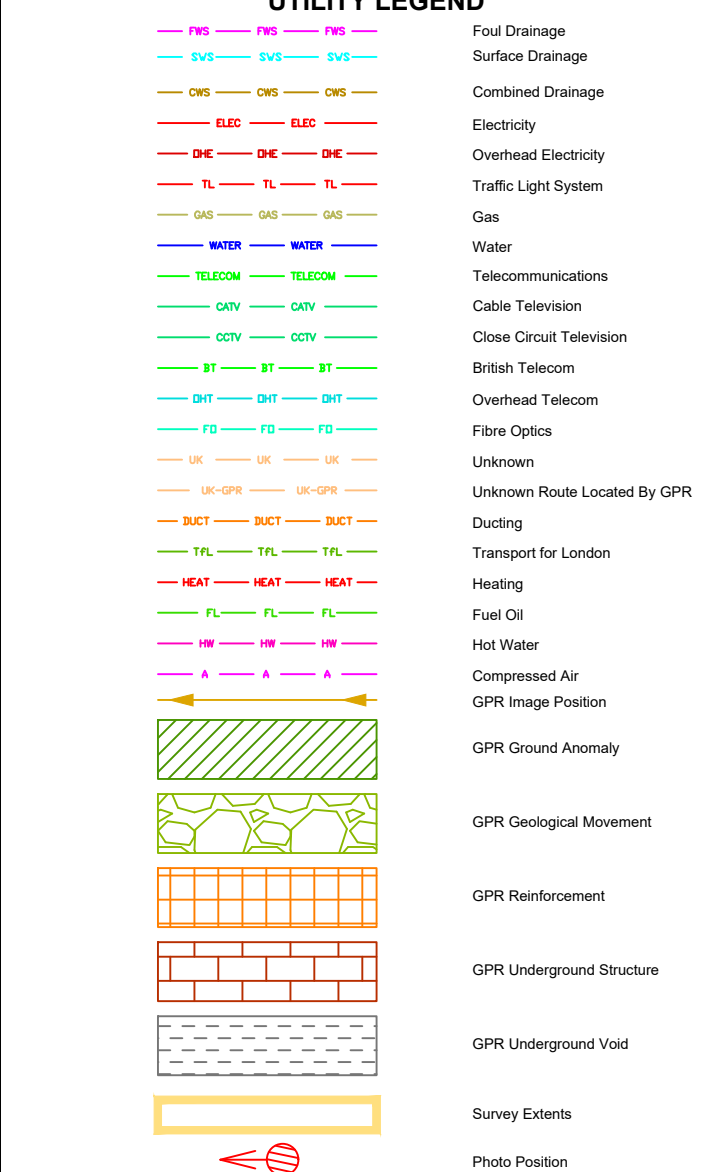
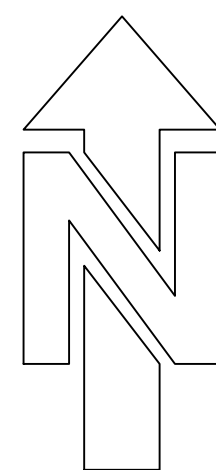
Rev: P1
Scale: 1:250 @ A1

Wellfield Chester Road Preston Brook WA7 3BA
T: 01928 752200 E: info@ewa.co.uk W: ewa.co.uk

Appendix B – Aerial Photograph



Appendix C – Topographic Survey

[illegible]

REV.	DETAILS	BY	DATE
GRID ORDNANCE SURVEY RELATED TO THE OR ACTIVE STATIONS BY GPS OBSERVATIONS		DATUM ORDNANCE SURVEY RELATED TO THE OR ACTIVE STATIONS BY GPS OBSERVATIONS	

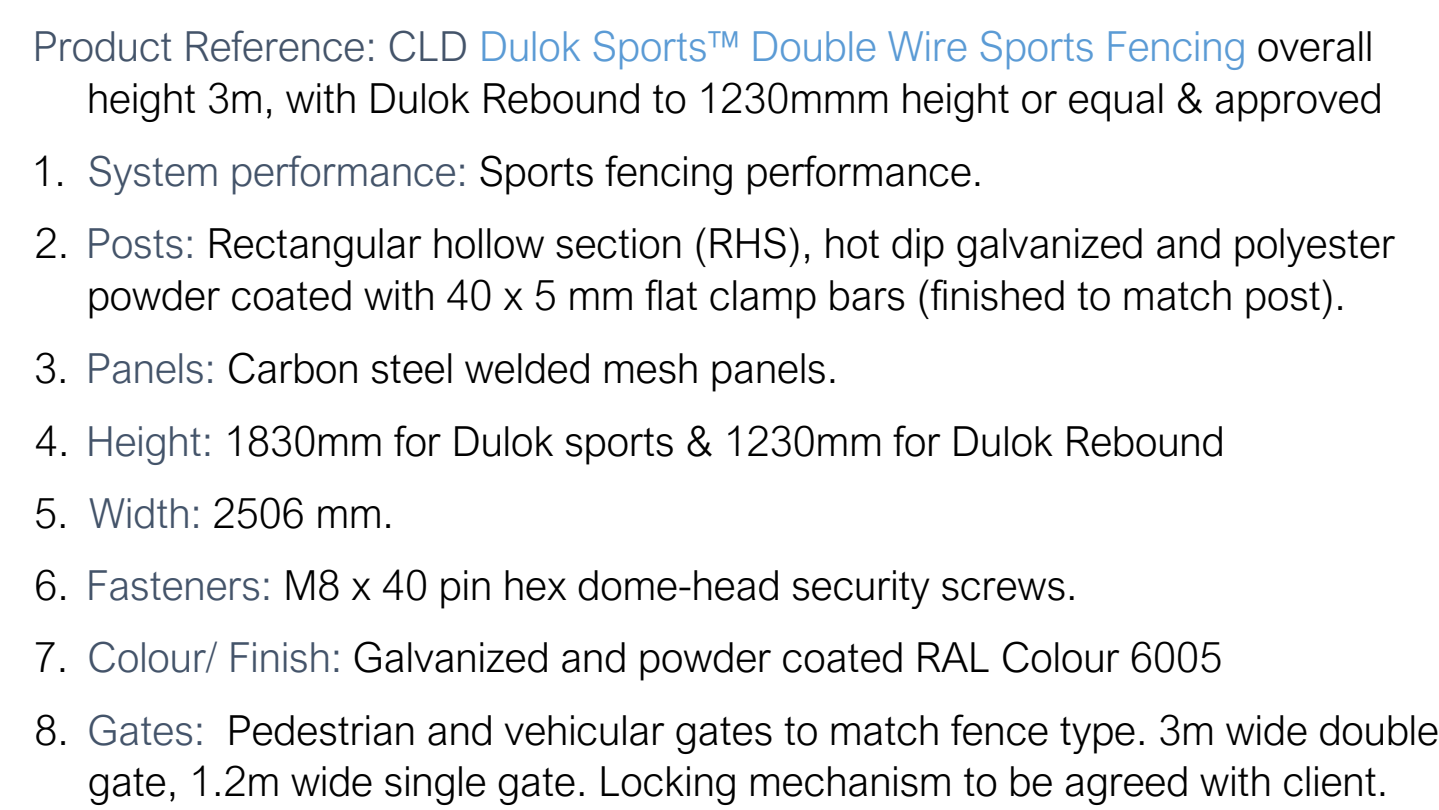


SURVEYED BY: PW / NS		DRAWN BY: VK		APPROVED BY: GJ	
SCALE: 1:200 @ A0			SURVEY DATE: 11 / 2019		
DRAWING NUMBER: 1887_P					
SHEET NUMBER: 1 of 1 A0					REV

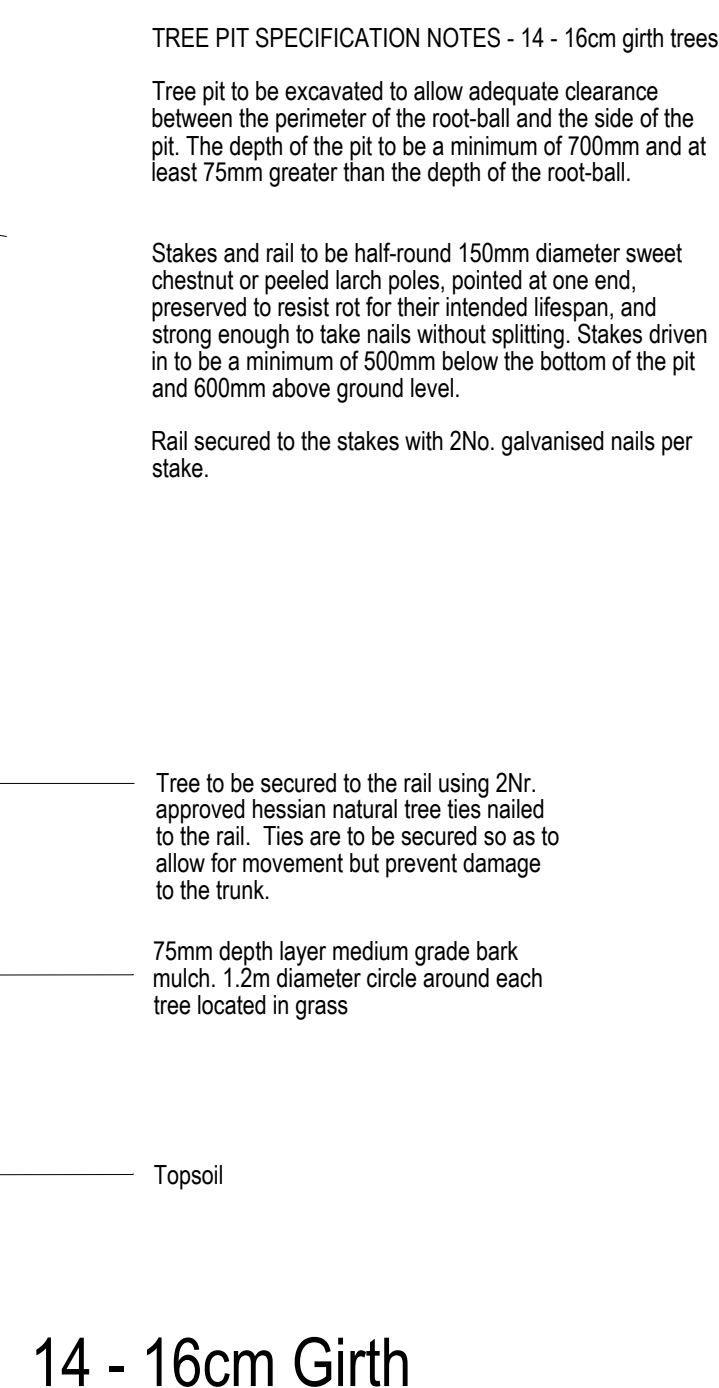
Appendix D – Proposed Site Plan



DETAIL A - MUGA Court Fencing
scale 1:20

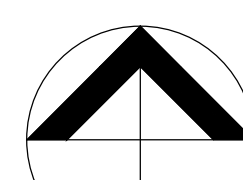


DETAIL B - 14 - 16cm Girth TREE PLANTING
scale 1:20



KEY

	Vehicular grade Asphalt Concrete to Engineers spec with 125mm HB2 road kerbs
	Pedestrian grade Asphalt Concrete to Engineers spec with 50mm pcpi per kerst laid flush
	Multi Use Games Area grade Asphalt Concrete to Engineers spec with 50mm pcpi kerst laid flush
	In situ concrete surfacing to Engineers specification
	Concrete block paving
	Existing trees retained and protected during construction in accordance with Tree Protection Plan & Arboricultural Method Statement
	Tree Root Protection Areas retained and protected during construction in accordance with Tree Protection Plan & Arboricultural Method Statement
	68% New trees, 14 - 16cm girth - see detail B adjacent
	10 Orchard Trees 2No. Red Windsor Apple Trees grown on M25 rootstock, 2No. Saturn Apple Trees grown on M25 rootstock. 2No. Limelight Apple Trees grown on M25 rootstock. 2No. Greenreaches Apple Trees grown on M25 rootstock.
	2No. Victoria Plum trees grown on St Julian Roadstock - Virginia Supported post given set at 1.2m diameter circle of bark mulch as noted below. Stake ties as required. Available from: Cross Brothers and Sons, Whispering Trees Nurseries Wimborneau Norfolk, PE34 3QB
	Existed grass over 150mm depth topsoil
	Eco Species Rich Grassland "Garminal WFG 27"
	Ornamental shrub/perennial planting into 350mm depth topsoil + compost, 4No. shrubs per m ² in 9 pots 75mm depth bark mulch spread on completion of planting Species to include: Banksia integrifolia Scaevola taccada Conocarpus teretifolius Ficus pumila Helleborus xanthophyllus Rosa rugosa Philadelphus coronaria Viburnum bursatum Cornus alba Lavandula angusticarpa Syringa vulgaris Salix caprea Corylus avellana Astragalus matronalis Proculus fraxinifolia "Little Red Robin" Prunella laurocerasus Pieris japonica Asplenium ad-nigrum Porospora luteo spinosa Spirea coccinea
	Ornamental shrub/perennial planting into 350mm depth topsoil + compost over 200mm depth subsoil to ensure free root growth, 4No. shrubs per m ² in 9 pots. 75mm depth bark mulch spread on completion of planting Species as above
	Existing hedge/woodland retained and protected during construction works
	Native species Hedge strip planting into 400mm depth topsoil + compost over 200mm depth subsoil to ensure free root growth, 75mm depth bark mulch spread on completion of planting Hedgeform, field maple, holly, crab apple, field rose, wild cherry & guelder rose. Planted in a double staggered row
	2.4m High Wedghead fencing
	2m high Weddesh Fencing
	3m high steel weld mesh sports fencing & Gates as Detail A adjacent
	3m High timber/composite hit and miss vertical pole fencing
	1.8m High timber/composite hit and miss vertical pole fencing
	Existing levels
	Proposed Levels
	Red Line site boundary
	Designated Parking for Electric Vehicle Charging (4no.)
	EV charging point to Engineers specification (2no units each with 2no charges)
	Doo barriers



elliswilliams

Project Number: 2718
Project Name: FS0911 Rochdale SEND

Drawing Status: STAGE 3
Drawing Number: **FS0911-EWA-ZZ-ZZ-D-A-9001**
Drawing Name: Proposed Site Plan

Date: 10.10.21
Drawn By: NH

Rev: P10
Scale: 1:200 @ A1

Wellfield Chester Road Preston Brook WA7 3BA
T: 01928 752200 E: info@ewa.co.uk W: ewa.co.uk

Appendix E – Flood Maps

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
385123/411143

Created
24 Jul 2023 15:43

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

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

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

Notes

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

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

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

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
385123/411143

Scale
1:2500

Created
24 Jul 2023 15:43

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

0 20 40 60m

Page 2 of 2



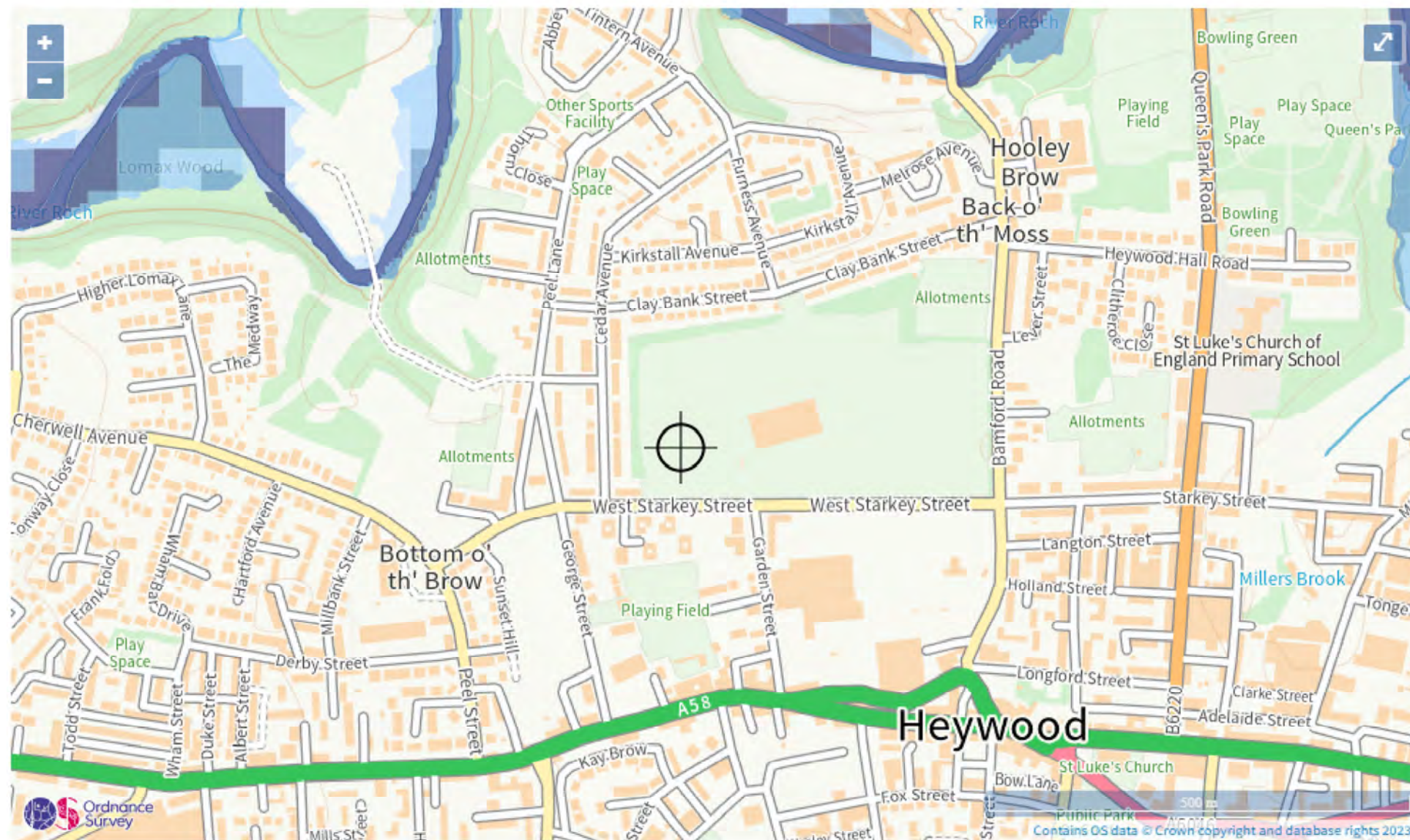
Flood risk

Extent of flooding



Location

Enter a place or postcode



Extent of flooding from rivers or the sea

High Medium Low Very low Location you selected

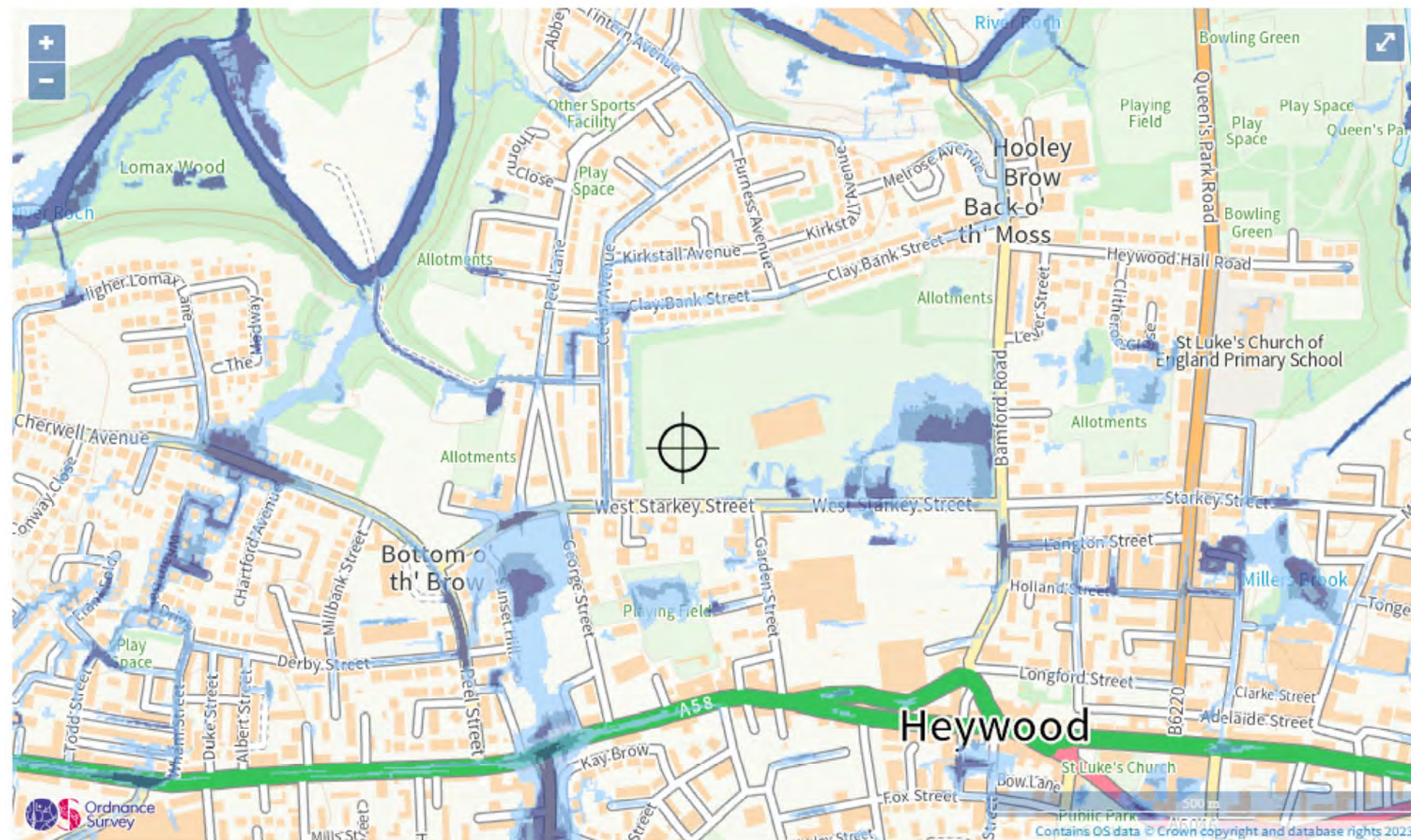
Flood risk

Extent of flooding



Location

Enter a place or postcode



Extent of flooding from surface water

● High ● Medium ● Low ○ Very low ⊕ Location you selected

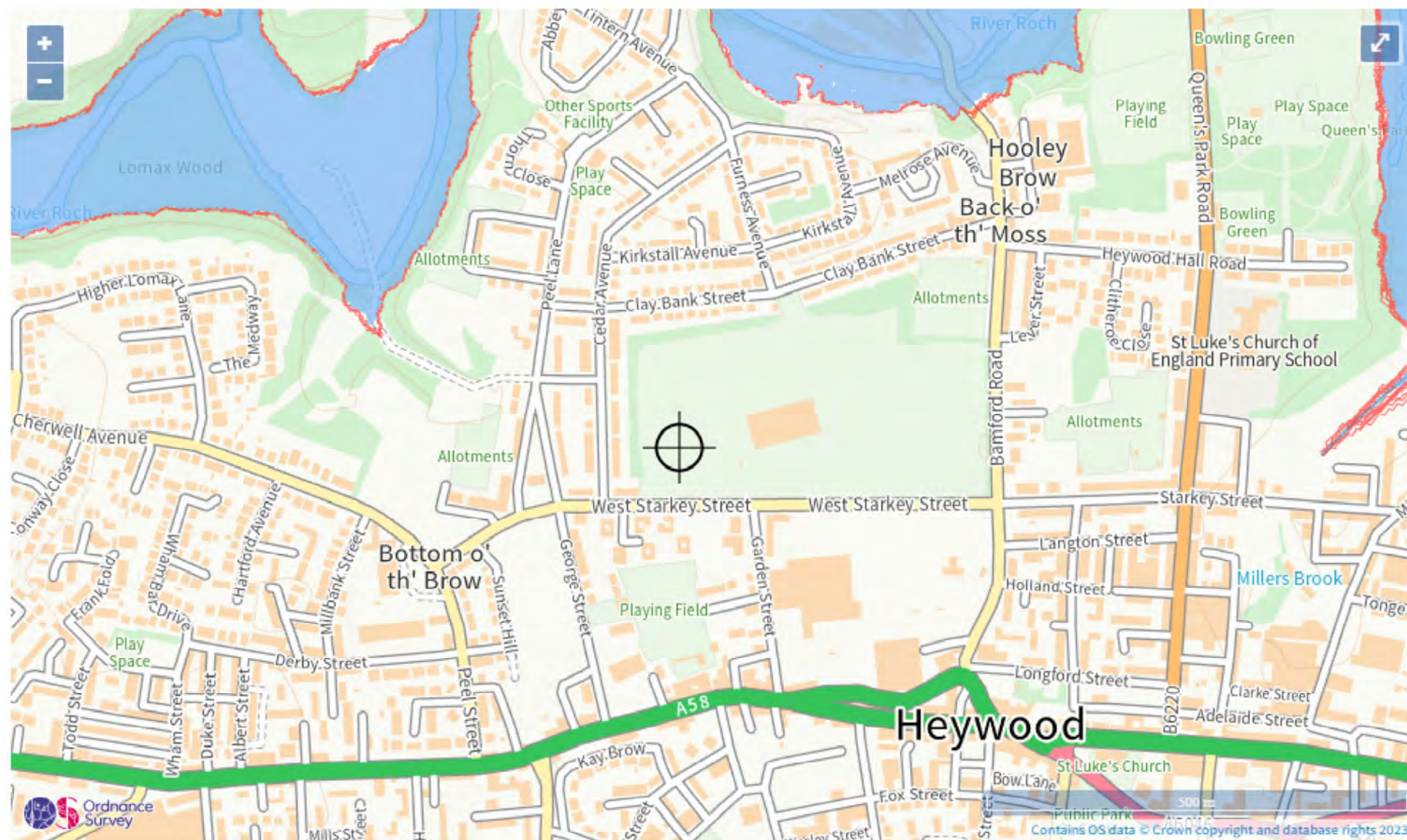
Flood risk

Extent of flooding



Location

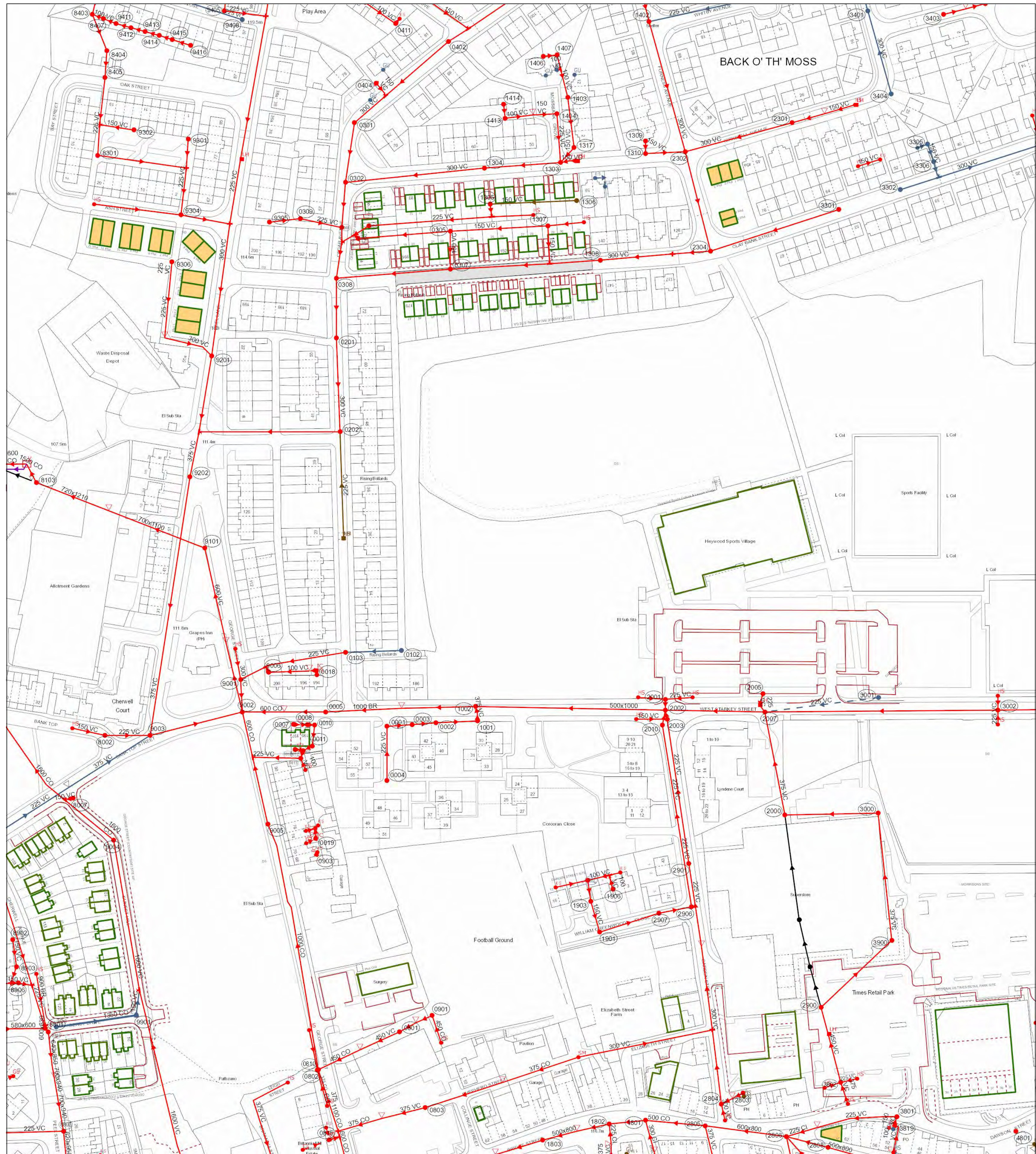
Enter a place or postcode



Maximum extent of flooding from reservoirs:

 when river levels are normal  when there is also flooding from rivers  Location you selected

Appendix F – United Utilities Sewer Map & Correspondence



Refo	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
0305	113.39	CO	112.29	150			VC	51.15662	1 in 23
1803	116.05	CO	108.83	500			VC	27.20204	1 in 26
8304	115.34	CO	113.23	225			VC	27.45066	
0012							VC	4.365511	
0004	112.48	CO	110.4	225			VC	39	
0009							VC	4.11388	
9403	120.5	CO	118.52	225			CO	12.38932	1 in 18
9414	112.84	CO	110.2	225			VC	8.250919	
1801	117.15	CO	110.75	500			VC	18.47837	1 in 88
8301	112.39	CO	110.9	225			VC	34.3379	1 in 49
1801	117.15	CO	110.75	500			VC	20.09975	1 in 40
8301	112.39	CO	110.9	225			VC	48.48747	1 in 85
0103	112.05	CO	108.47	225			VC	60.48788	1 in 45.8690011
1002	112.9	CO	100.86	500			BR	41.01219	1 in 84
9413	111.8	CO	110.99	150			VC	8.110815	
8902							VC	15.12375	
2805							VC	33.13608	1 in 23
0102	112.17	SW	109.74	225			VC	31.01612	1 in 282
1803							VC	17.75085	
0801	113	CO	108.63	450			VC	24.18609	1 in 43
0103							VC	11.63232	
3801	117.79	CO	115.07	225			VC	44.7093	
2805	117.81	CO	112.15	600			CO	45.38654	
8403	117	CO	114.79	225			VC	21.54066	
8006							VC	3.486236	
9416							VC	10.36871	
1902							VC	11.74039	
9411							VC	7.346055	
9306	114.47	CO	112.61	225			VC	42.19004	1 in 105
9309	113.54	CO	109.99	225			VC	101.835	
3000							VC	51.55582	
9301							VC	18.03122	
0402	120.59	CO	117.96	300			VC	68.78772	1 in 28
0901	113.27	CO	109.29	450			CO	9.848858	1 in 28
3404	122.87	SW	119.22	300			VC	17.80187	1 in 177
1406							VC	7.89921	
1403	120.62	CO	118.45	225			VC	27.97253	
8820	111.87	SW	107.84	1350			CO	44.79308	1 in 448
0211							VC	5.771389	
9415							VC	7.525068	
1407							VC	24.29438	
1309							VC	7	
3401	121.39	SW	118.85	300			VC	54.10224	1 in 9
8806	112.11	CO	110	150			VC	5.586788	
8801	111.81	CO	108.69	600			BR	1.206913	
1802	116.78	CO	109.99	500			VC	18.43909	1 in 29
8903	121.16	CO	110.25	150			VC	9.486833	
2809							CO	23.78913	1 in 52
2803	117.74	CO	112.49	500			VC	6.786044	1 in 15
0001	113.3	CO	111.05	225			VC	14.03567	1 in 13
8408	118.46	SW	116.45	225			VC	65.14599	1 in 24
3900							VC	70.80742	
1307	114.35	CO	113.52	150			VC	44.98327	1 in 44
1306							VC	48.94165	
8407							VC	6.612728	
0003	112.53	CO	109.95	225			VC	13.0394	1 in 100
8404							VC	15.0333	
9412							VC	8.548801	
2900							VC	53.94321	
8002	110.52	CO	108.44	225			VC	26	1 in 27
9202	111.55	CO	108.31	375			VC	144.6824	1 in 163
9305	114.14	CO	112.7	225			VC	17.11724	
0015							VC	26.61169	
0202	112.51	CO	109.95	300			VC	78	
8202	117.2	CO	115.74	150			VC	19.25539	1 in 17
2005	111.2	CO	107.99	225			VC	11.32456	
1001	112.77	CO	109.61	225			VC	4	1 in 13
3301	117.33	CO	115.42	300			VC	74.63243	1 in 91
3306							VC	9.237498	
8802	111.91	CO	108.69	640			BR	26.18234	1 in 119
1402	123.6	CO	121.32	300			VC	74.72917	1 in 20
1310							VC	22.02711	
1304	115.65	CO	113.67	300			VC	77.41447	1 in 131
8405	119.56	CO	116.14	225			VC	21.18483	
8005	111.53	CO	101.31	600			CO	63.56099	
8805	112.22	CO	108.35	620			BR	39.20459	
1906							VC	8.01318	
2301	121.07	CO	118.57	300			VC	61.13101	1 in 60
0309							VC	23.5372	
0303	113.5	CO	111.1	300			VC	28.22375	1 in 44
0002	112.61	CO	109.82	225			VC	23.02173	1 in 177
2304	116.89	CO	114.5	300			VC	21.05864	
8103	108.85	CO	98.52	1500			CO	11.52595	1 in 576
1303	117.24	CO	115.31	300			VC	42.10701	1 in 26
1308							VC	63.10309	
2901	113.13	CO	111.39	225			VC	80.895	1 in 40
3307							VC	63.1981	
3807	117.02	CO	113.96	450			VC	42.88966	
8001	111.34	CO	108.02	300			VC	18.02776	
8004	111.73	CO	107.77	1600			CO	115.57469	
1307	114.35	CO	113.09	150			VC	21.0238	
2000							VC	58.09393	
3302	117.11	SW	114.64	300			VC	81.90849	1 in 41
0201	112.59	CO	0	300			VC	52.03845	
1305	114.91	CO	113.81	150			VC	7.071068	
0306	112.96	CO	111.55	150			VC	2.828427	
0802	112.32	CO	101.07	1000			CO	139.4223	1 in 211
0304	113.09	CO	111.03	225			VC	17.49624	
0201	112.2	CO	109.47	375			VC	68.07443	1 in 59
0301	117.32	CO	115.4	300			VC	33.37664	1 in 14
1317							VC	11.14543	1 in 9
2007	111.26	CO	101.68	500			BR	55.00909	
8803	113.95	CO	110.31	375			VC	24.73663	
2302	111.81	CO	101.81	500			BR	105.019	1 in 111
0302	114.93	CO	113.02	300			VC	25.07987	1 in 14
3819							VC	5.8095	
3001							VC	63.50591	1 in
3305							VC	10.22257	
8003	110.22	CO	107.3	375			VC	52.63079	1 in 25
1404	119.57	CO	116.95	225			VC	27.07344	1 in 17
0411							VC	0.62503	
8007	111.05	CO	109.25	150			VC	4.769771	
8101	112	CO	101.16	100			VC	56.97133	1 in 49
2001	111.8	CO	108.27	225			VC	6	1 in 46
0005	111.92	CO	100.65	1000			BR	23	
3002	110.97	CO	102.48	500			BR	129.0039	1 in 161
2003	111.81	CO	109.28	225			VC	5.09962	1 in 13
8405	116.52	CO	114.6	225			VC	43.20189	
8901	111.56	SW	0				UN	0.555307	
2804	117.56	CO	114.63	300			VC	41.30375	
0308	112.93	CO	110.44	300			VC	33	
2302	120.05	CO	117.49	300			VC	56.76385	1 in 19
9002	111.48	CO	101.83	600			CO	39.95125	1 in 118
1413							VC	15.55678	
2010	111.83	CO	109.02	225			VC	8.458104	1 in 423

LEGEND

Abandoned

Foul

Surface Water

Combined

Public Sewer

Private Sewer

Section 104

Rising Main

Sludge Main

Overflow

Water Course

Highway Drain

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

Manhole

Head of System

Extent of Survey

Rodding Eye

Inlet

Discharge Point

Vortex

Penstock

Washout Chamber

Valve

Air Valve

Non Return Valve

Soakaway

Gully

Cascade

Flow Meter

Hatch Box

Oil Interceptor

Summit

Drop Shaft

Orifice Plate

Side Entry Manhole

Outfall

Screen Chamber

Inspection Chamber

Bifurcation Chamber

Lamp Hole

T Junction / Saddle

Catchpit

Valve Chamber

Vent Column

Vortex Chamber

Penstock Chamber

Network Storage Tank

Sewer Overflow

Ww Treatment Works

Pump Station

Septic Tank

Control Kiosk

Change of Characteristic

MANHOLE FUNCTION

FO Foul

SW Surface Water

CO Combined

OV Overflow

SEWER SHAPE

CI Circular

TR Trapezoidal

EG Egg

AR Arch

OV Oval

BA Barrel

FT Flat Top

HO HorseShoe

RE Rectangular

UN Unspecified

SQ Square

SEWER MATERIAL

AC Asbestos Cement

BR Brick

PE Polyethylene

RP Reinforced Plastic Matrix

CO Concrete

CSB Concrete Segment Bolted

CSU Concrete Segment Unbolted

CC Concrete Box Culvert

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:

186 WEST STARKEY STREET,
HEYWOOD,
OL10 4TW

Scale: 1:1250
Nodes: 126
Sheet: 1 of 1

Date: 30/09/2021

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.

Crown copyright and database rights 2017 Ordnance Survey 100022432. Unauthorised reproduction will infringe these copyrights.

John Speers

From: wastewaterdeveloperservices@uuplc.co.uk
Sent: 01 August 2023 13:15
To: John Speers
Cc: Peter Bryan
Subject: RE: Pre Development Enquiry for: Rochdale Send Heywood OL10 4TW UU Reference Number : 03298091

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: 223-018 - Rochdale SEND

Good Afternoon John,

Thank you for the report.

I have reviewed this and confirm I am happy to discount infiltration, therefore I can confirm United Utilities have no objection to the proposed connection to the UU combined water sewer to the west of the site at a maximum discharge rate of 5.0 L/s subject to s106 application and approval.

Please let me know if you require anything else.

Kind regards,



Eireann Thompson
Assistant Developer Engineer
Developer Services & Metering
Customer Services
Mobex: 07553074138
unitedutilities.com

Did you know we now have a live chat facility available to you Mon to Friday 8 -5pm. You just click on the orange live chat box on our webpage and one of our advisors will be ready to chat to you and help you with your enquiry <https://www.unitedutilities.com/builders-developers/> or you can email us at developerserviceswater@uuplc.co.uk

If you have received a great service today why not tell us?
Visit: [unitedutilities.com/wow](https://www.unitedutilities.com/wow)

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

From: John Speers [johnspeers@ajpltd.co.uk]
Sent: 28/07/2023 11:44
To: wastewaterdeveloperservices@uuplc.co.uk
Cc: peterbryan@ajpltd.co.uk
Subject: RE: Pre Development Enquiry for: Rochdale Send Heywood OL10 4TW UU Reference Number : 03298091

Morning Eireann,

Please see attached SI report as requested.

The attached Geotechnics Ground Investigation Report, FS0911-GEO-ZZ-XX-T-X-0001 indicates that the site is underlain by peat, which is then underlain by clays. The presence of the peat stratum would preclude the use of infiltration across the site as this could lead to inundation settlement issues.

Regards

John

John Speers

Associate



☎ 0151 227 1462

📱 07841 832 409

✉ johnspeers@ajpltd.co.uk

📍 1 Dale St, Liverpool, L2 2ET

From: wastewaterdeveloperservices@uuplc.co.uk <wastewaterdeveloperservices@uuplc.co.uk>

Sent: 28 July 2023 11:31

To: John Speers <johnspeers@ajpltd.co.uk>

Cc: Peter Bryan <peterbryan@ajpltd.co.uk>

Subject: RE: Pre Development Enquiry for: Rochdale Send Heywood OL10 4TW UU Reference Number : 03298091

Good Morning John,

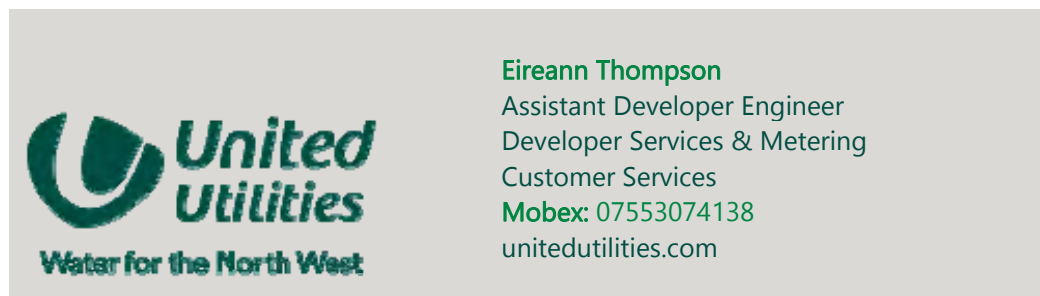
Thank you for your email and the correspondence previously attached, I am just picking this up for Ashleigh whilst

she is on leave.

I can see below you have mentioned you have consulted a site investigation to discount infiltration, can you please send this over for our review?

I am happy to discount going to a watercourse as a viable option based on the below but we would just need to see the site investigation with applicable evidence before being able to confirm a connection point.

Kind regards,



Did you know we now have a live chat facility available to you Mon to Friday 8 -5pm. You just click on the orange live chat box on our webpage and one of our advisors will be ready to chat to you and help you with your enquiry <https://www.unitedutilities.com/builders-developers/> or you can email us at developerserviceswater@uuplc.co.uk

If you have received a great service today why not tell us?

Visit: [unitedutilities.com/wow](https://www.unitedutilities.com/wow)

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

From: wastewaterdeveloperservices@uuplc.co.uk [wastewaterdeveloperservices@uuplc.co.uk]

Sent: 24/07/2023 20:10

To: johnspeers@ajpltd.co.uk

Cc: peterbryan@ajpltd.co.uk

Subject: RE: Pre Development Enquiry for: Rochdale Send Heywood OL10 4TW UU Reference Number : 03298091

Good Evening John,

Yes I can see it has been passed to the engineer Ashleigh Bellerby for a response
The response is due 31.7.2023

Regards

Lucie

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

From: John Speers [johnspeers@ajpltd.co.uk]

Sent: 24/07/2023 10:37

To: wastewaterdeveloperservices@uuplc.co.uk

Cc: peterbryan@ajpltd.co.uk

Subject: RE: Pre Development Enquiry for: Rochdale Send Heywood OL10 4TW UU Reference Number : 03298091

Good Morning,

Can someone please confirm if the below email has been picked up, as I did not get the normal automatic response email. If so, can someone please give me a timeframe for a response?

Kind Regards

John

John Speers

Associate



☎ 0151 227 1462

☎ 07841 832 409

✉ johnspeers@ajpltd.co.uk

📍 1 Dale St, Liverpool, L2 2ET

From: John Speers

Sent: 17 July 2023 15:46

To: 'wastewaterdeveloperservices@uuplc.co.uk' <wastewaterdeveloperservices@uuplc.co.uk>

Cc: Peter Bryan <peterbryan@ajpltd.co.uk>

Subject: RE: Pre Development Enquiry for: Rochdale Send Heywood OL10 4TW UU Reference Number : 03298091

Good afternoon,

Further to the below pre dev response, we have had some discussions with the LLFA regarding the surface water discharge from the proposed development site.

As the site investigation has identified strata comprising of peat underlain by clays, infiltration has been deemed as not suitable for this development. The nearest watercourse is the River Roch which is located around 330m to the west of the site and due to the distance across developed third-party land, discharge into this watercourse has been deemed as impractical. As such, the only remaining option is for the surface water runoff to discharge to either a surface water or combined water sewer.

Surveys have indicated that there is an existing private surface water drain to the north of the site, however it is shallow and as per the attached outline drainage strategy drawing, this would require pumping the surface water runoff from the proposed development. Due to the need for pumping the surface water runoff from the site, the LLFA have commented that they believe the more sustainable option would be to discharge the surface water runoff into the UU combined water to the west of the site. See attached email correspondence from LLFA.

Given the above information and the attached LLFA comments can you please confirm that UU would agree with the LLFA and as such the surface water runoff from the proposed development can discharge into the UU combined water sewer to the west of the site at a maximum discharge rate of 5.0 L/s?

Kind Regards

John

John Speers

Associate



☎ 0151 227 1462

📱 07841 832 409

✉ johnspeers@ajpltd.co.uk

📍 1 Dale St, Liverpool, L2 2ET

From: wastewaterdeveloperservices@uuplc.co.uk <wastewaterdeveloperservices@uuplc.co.uk>

Sent: 18 January 2023 15:16

To: John Speers <johnspeers@ajpltd.co.uk>

Subject: Pre Development Enquiry for: Rochdale Send Heywood OL10 4TW UU Reference Number : 03298091

Good afternoon John,

Pre Development Enquiry for: Rochdale Send Heywood OL10 4TW UU Reference Number : 03298091

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

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 6723 723 or refer to the link below:

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

Foul Water

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

Our preferred point of discharge would be as proposed to the 225mm diameter public combined sewer UUMH102 located to the West of your proposed development at an unrestricted rate. I have confirmed with our Network engineer that this is in fact a combined sewer.

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

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water

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

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

This is outlined as follows, in order of priority:

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

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

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

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

Infiltration

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

feasible.

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

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

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

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

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

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

Highway Drainage

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

Public Sewer

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

Once evidence is provided as outlined above, United Utilities will consider a connection to the 225mm diameter public combined sewer UUMH102 located West of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5l/s.

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

I note the proposed drainage you submitted had a different point of connection for surface water, this would not be acceptable to United Utilities due to that length of sewer being a dedicated foul sewer.

Levels

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

Land drainage / Overland flows / track drainage

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

Existing Wastewater Assets Crossing the Site

We have reviewed our records and can confirm that there does not appear to be any charted public sewers located within the boundary of proposed development. However, due to the accuracy of the records and the public sewer transfer legislation in 2011, not all public sewers are shown on our records so we would ask that you proceed with caution and carry out your own site investigation works. If any uncharted sewers are identified while carrying out your works we would ask that you contact United Utilities at the earliest opportunity so that we can offer guidance and update our records.

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address:

DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link

below:

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

Connection Application

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

<https://www.unitedutilities.com/builders-developers/wastewater-services/sewer-connections/sewer-connection/>

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

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

Many thanks and kind regards,



Ashleigh Bellerby

Assistant Developer Engineer
Developer Services & Metering
Customer Services
T: 07826891650
unitedutilities.com

If you have received a great service today why not tell us?

Visit: unitedutilities.com/wow

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

From: wastewaterdeveloperservices@uuplc.co.uk [wastewaterdeveloperservices@uuplc.co.uk]

Sent: 18/01/2023 14:43

To: johnspeers@ajpltd.co.uk

Subject: Pre Development Enquiry for: 1 Building, William Pitt Industrial Estate, Whitehaven Cumbria CA28 6AU UU
Reference Number : 03298091

Good afternoon John,

**Pre Development Enquiry for: 1 Building, William Pitt Industrial Estate, Whitehaven Cumbria CA28 6AU UU
Reference Number : 03298091**

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

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 6723 723 or refer to the link below:

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

Foul Water

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

Our preferred point of discharge would be as proposed to the 225mm diameter public combined sewer UUMH102

located to the West of your proposed development at an unrestricted rate. I have confirmed with our Network engineer that this is in fact a combined sewer.

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

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water

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

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

This is outlined as follows, in order of priority:

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

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

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

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

Infiltration

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

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

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

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

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

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

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

Highway Drainage

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

Public Sewer

In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging

surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.

Once evidence is provided as outlined above, United Utilities will consider a connection to the 225mm diameter public combined sewer UUMH102 located West of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5l/s.

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

I note the proposed drainage you submitted had a different point of connection for surface water, this would not be acceptable to United Utilities due to that length of sewer being a dedicated foul sewer.

Levels

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

Land drainage / Overland flows / track drainage

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

Existing Wastewater Assets Crossing the Site

We have reviewed our records and can confirm that there does not appear to be any charted public sewers located within the boundary of proposed development. However, due to the accuracy of the records and the public sewer transfer legislation in 2011, not all public sewers are shown on our records so we would ask that you proceed with caution and carry out your own site investigation works. If any uncharted sewers are identified while carrying out your works we would ask that you contact United Utilities at the earliest opportunity so that we can offer guidance and update our records.

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address:

DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:

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

Connection Application

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

<https://www.unitedutilities.com/builders-developers/wastewater-services/sewer-connections/sewer-connection/>

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

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

Many thanks and kind regards,



Ashleigh Bellerby
Assistant Developer Engineer
Developer Services & Metering
Customer Services
T: 07826891650
unitedutilities.com

If you have received a great service today why not tell us?

Visit: unitedutilities.com/wow

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

From: seweradoptions@uuplc.co.uk [seweradoptions@uuplc.co.uk]

Sent: 05/01/2023 16:04

To: johnspeers@ajpltd.co.uk

Subject: Our reference - 03418430



PRE DEVELOPMENT APPLICATION AT: Rochdale Send – UU Ref 03418430

Please accept this email as receipt of your application received on 04.01.2022 for the above development. This has now been logged on our system and the job reference is 03418430 we would ask that you quote this reference in all future correspondence.

I have reviewed your application (and attachments) and can confirm this is suitable to be passed to our engineer for technical assessment. You will receive their response within 8 working days.

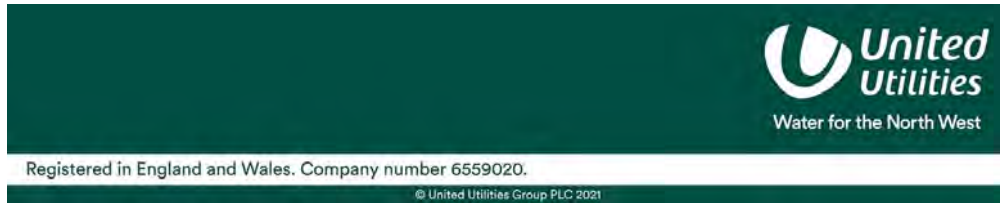
Kind regards

If you would like to discuss this by phone, please give me a call between 8am and 6pm Monday to Friday,
I'm on 0345 072 6067 ext. 33050. Alternatively, you can reply to this email and I will get back to you as soon as possible.

Kind regards,
Lucie Gaskell

Did you know we now have a live chat facility available to you between 8am and 5pm Monday to Friday. Just click on the link on our webpage and one of our advisors will be ready to chat to you and help you
with your enquiry <https://www.unitedutilities.com/builders-developers/>

If I am unavailable on the number above and you need to speak to someone else, our office number is 0345 072 6067



The information contained in this e-mail is intended only for the individual to whom it is addressed. It may contain legally privileged or confidential information or otherwise be exempt from disclosure. If you have received this Message in error or there are any problems, please notify the sender immediately and delete the message from your computer. You must not use, disclose, copy or alter this message for any unauthorised purpose. Neither United Utilities Group PLC nor any of its subsidiaries will be liable for any direct, special, indirect or consequential damages as a result of any virus being passed on, or arising from the alteration of the contents of this message by a third party.

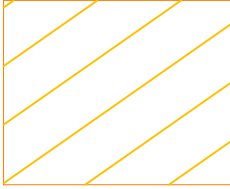
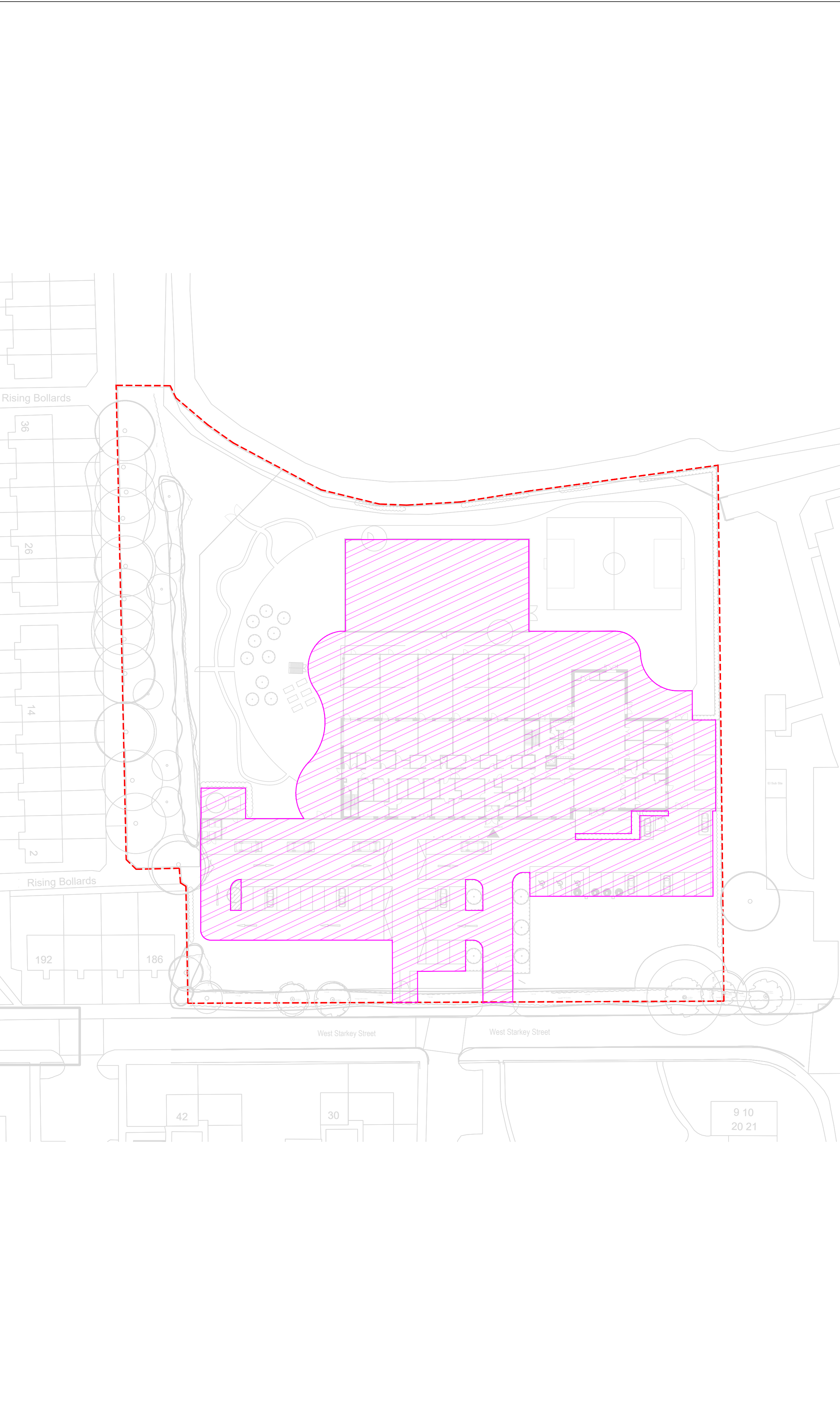
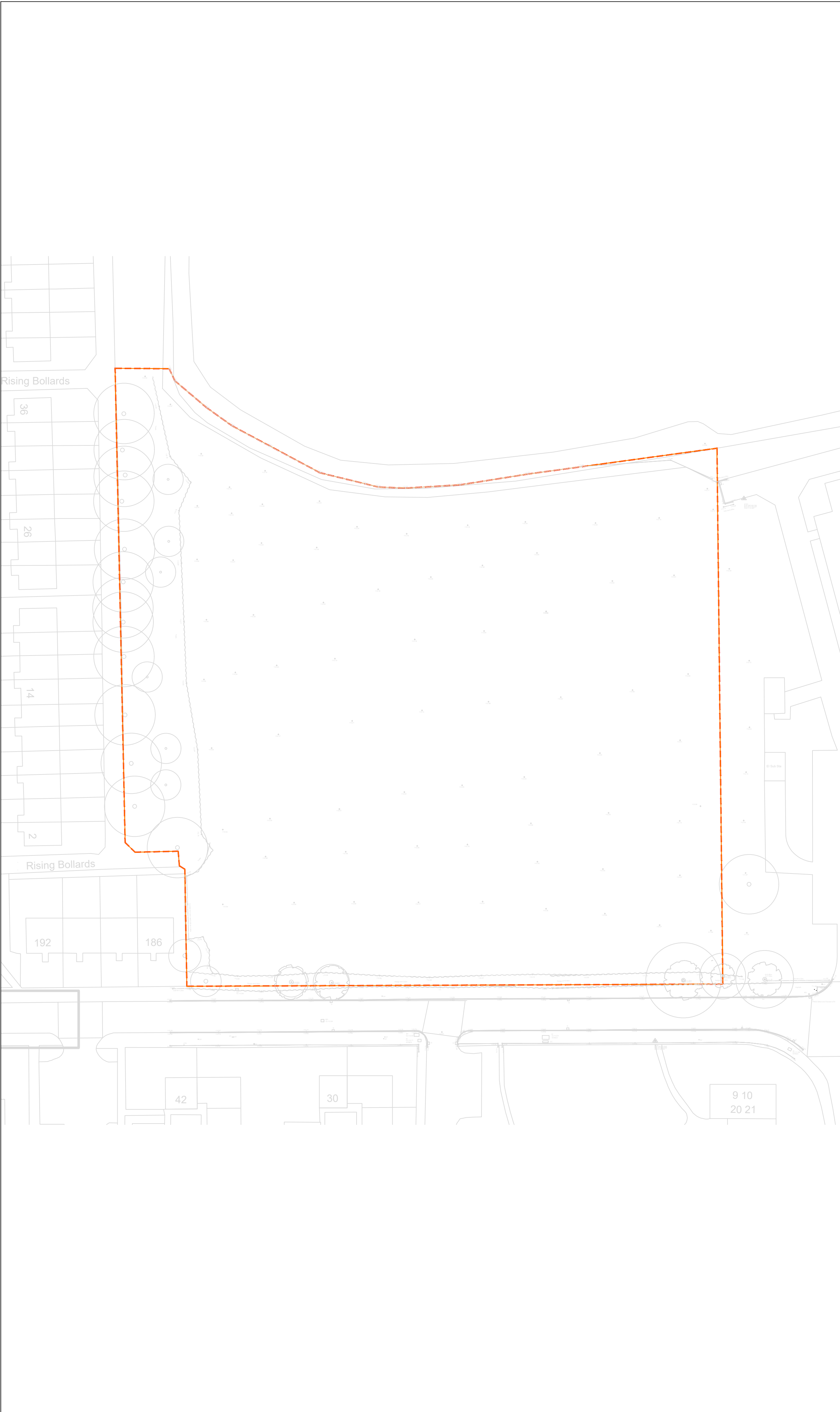
United Utilities Group PLC, Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP
Registered in England and Wales. Registered No 6559020

www.unitedutilities.com

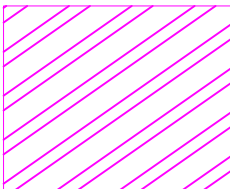
www.unitedutilities.com/subsidiaries



Appendix G – Pre & Post Development Impermeable Areas Drawing



PRE DEVELOPMENT
IMPERMEABLE AREAS = 0m²



POST DEVELOPMENT
IMPERMEABLE AREAS = 5,914m²

P01	25.07.2023	PRELIMINARY ISSUE		JJR	JRS	PB
REV	DATE	DESCRIPTION		BY	CHK	APP

DRAWING STATUS:

PRELIMINARY

CLIENT:

TILBURY DOUGLAS

ARCHITECT:

ELLIS WILLIAMS ARCHITECTS

PROJECT:

ROCHDALE SEND
HEYWOOD

TITLE:

PRE & POST DEVELOPMENT
IMPERMEABLE AREAS

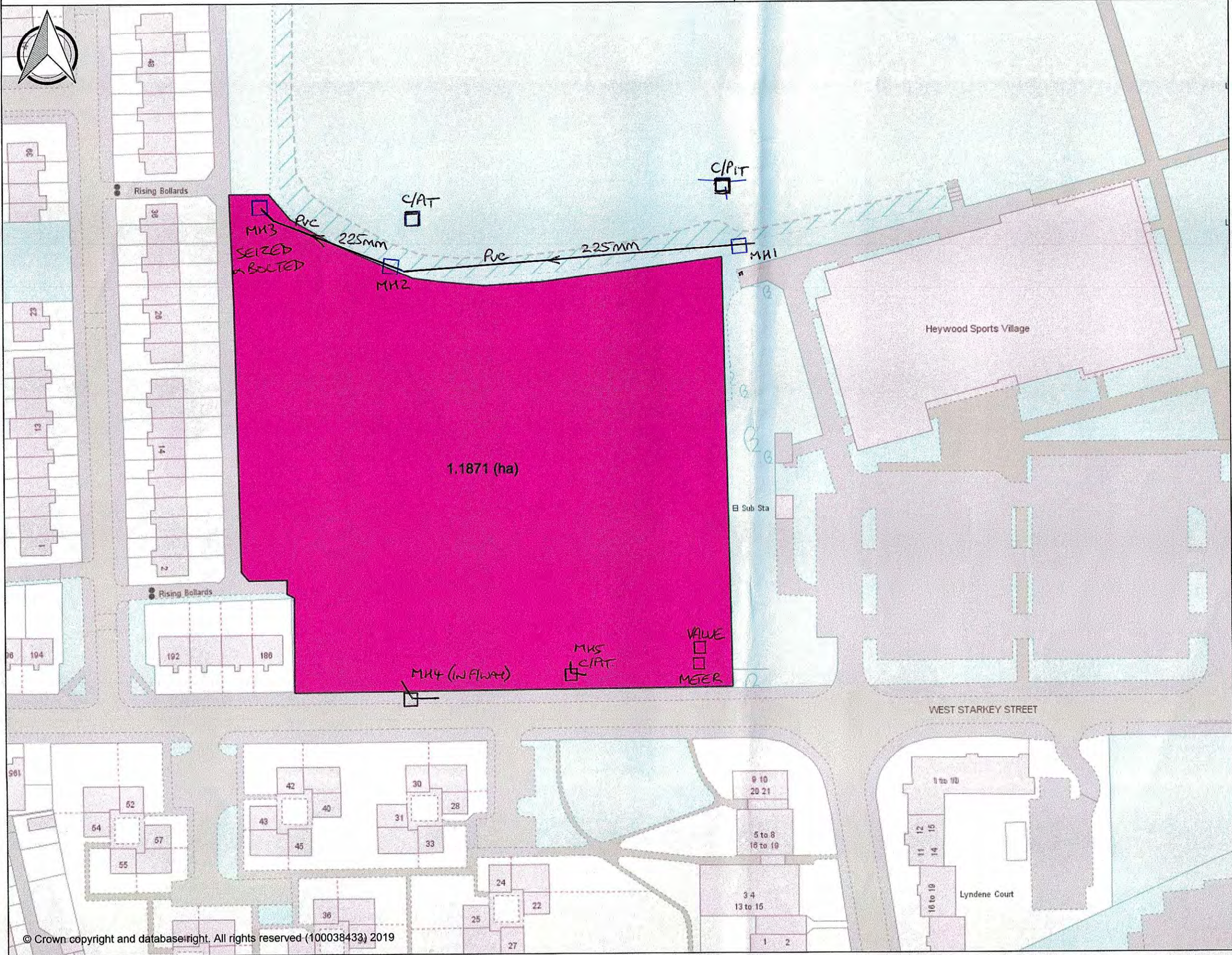
STATUS:	PROJECT No.	PROJECT	ORIGINATOR	VOL	SYS	LEVEL	TYPE	ROLE	DRAWING No.	REV:
S2	223-018	FS0911 - AJP - ZZ - 00 - SK - C - 0001								P01

SCALE @ A1:	DESIGNED:	DRAWN:	CHECKED:	APPROVED:	DATE:
1:500	JJR	JJR	JRS	PB	JUL 2023

 consulting engineers

0151 227 1462 info@ajpltd.co.uk 01 Dale Street, Liverpool, L2 2ET

Appendix H – Existing Drainage Information



Building Outlines

Site Outlines





Project

Project Name: 29680 - Heywood Sports Village
Project Description: Converted project from v8 project
Project Number: 1
Project Date: 09/12/2019
Inspection Standard: MSCC3 Sewers & Drainage GB (SRM4 Scoring)



Table of Contents

Project Name	Project Number	Project Date
29680 - Heywood Sports Village	1	09/12/2019

Project Information	P-1
Defect Grade Description (Section)	P-2
Section: 1; MH1 > MH2 (MH1X)	1
Section: 2; MH2 > Main line (MH2X)	3



Drain Alert Limited

Cripple Gate Lane, Preston

Tel. 01254851500

admin@drain-alert.co.uk

Project Information

Project Name	Project Number	Project Date
29680 - Heywood Sports Village	1	09/12/2019

Contractor

Company: Drain Alert Limited
Contact: Stephen Ormisher
Department: Surveys
Street: Cripple Gate Lane
Town or City: Preston
County: Lancashire
Phone: 01254851500
Fax: 01254854004
Email: admin@drain-alert.co.uk

Defect Grade Description (Section)

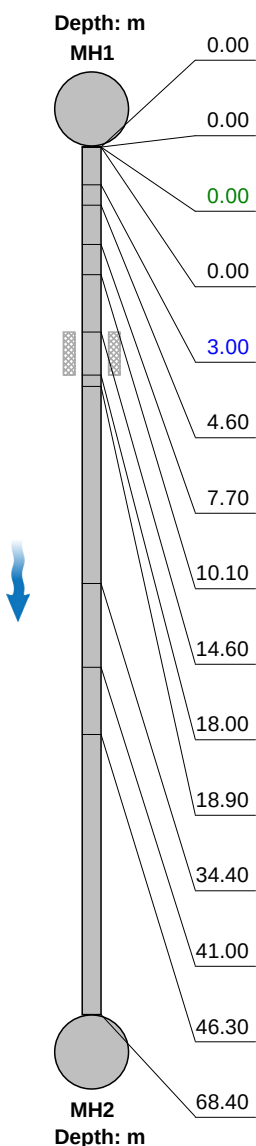
Project Name 29680 - Heywood Sports Village	Project Number 1	Project Date 09/12/2019
---	----------------------------	-----------------------------------

1:	Brick: No structural defects. Pipe: No structural defects. Acceptable structural condition.
2:	Brick: Circumferential cracking; single longitudinal crack; surface mortar loss (depth missing < 15mm); surface damage - slight spalling (breaking away of small fragments from the surface); surface damage - slight wear (increased roughness). Pipe: Circumferential crack; moderate joint defects (i.e. medium open joint or medium displaced joint); surface damage - slight spalling (breaking away of small fragments from the surface) or slight wear (increased roughness). Minimal collapse likelihood in the short term but potential for further deterioration.
3:	Brick: Medium mortar loss (depth missing 15-50mm) without other defects; more than one longitudinal crack (at a single location); multiple cracking; single bricks displaced; deformation < 5%; no fracture and only moderate mortar loss; surface damage - medium spalling (large areas of chipped brick); surface damage - medium wear (large area of brick surface is missing). Pipe: Fracture with no deformation or deformation < 5%; longitudinal cracking or multiple cracking; minor loss of level; severe joint defects (i.e. large open joint or large displaced joint); surface damage - partial area of pipe surface is missing or worn. ! Collapse unlikely in the near future but further deterioration likely !
4:	Brick: Total mortar loss (depth missing > 50mm) with deformation > 10%; deformation up to 10% and fractured; displaced or hanging brickwork; small number of missing bricks; dropped invert (drop > 20mm); moderate loss of level; surface damage - large spalling (entire surface of brick is missing); surface damage - large wear (entire surface of brick is missing). Pipe: Broken; deformation up to 10% and broken; fracture with deformation 5-10%; multiple fractures; serious loss of level; serious joint defects with voids or soil visible (open joint with > 50mm soil or void visible or joint displacement > 25% of diameter); surface damage - entire area of pipe surface is missing or severely worn. !! Collapse likely in the foreseeable future !!
5:	Brick: Already collapsed; missing Invert; deformation > 10% and fractured; displaced or hanging brickwork and deformation < 10%; extensive areas of missing brickwork. Pipe: Already collapsed; deformation > 10% and broken; extensive areas of pipe fabric missing; fractures with deformation > 10% !!! Collapsed or collapse imminent !!!

Section Inspection - 09/12/2019 - MH1X

Section 1	Inspection 1	Date 09/12/19	Time 11:00	Client's Job Ref 1	Weather Dry	Pre Cleaned No	PLR MH1X
Operator KL		Vehicle VEHICLE1		Camera Camera1	Preset Length Not Specified	Legal Status Not Specified	Alternative ID Not Specified

Town or Village:	Sports Village	Inspection Direction:	Downstream	Upstream Node:	MH1
Road:	West Starkey Street	Inspected Length:	68.40 m	Upstream Pipe Depth:	
Location:		Total Length:	68.40 m	Downstream Node:	MH2
Surface Type:	Unknown	Joint Length:	0.00 m	Downstream Pipe Depth:	
Use:	Combined		Pipe Shape:	Circular	
Type of Pipe:			Dia/Height:	225 mm	
Year Constructed:			Pipe Material:	Vitrified clay	
Flow Control:			Lining:	No Lining	
Inspection Purpose:	Sample survey to determine asset condition		Lining Material:	No Lining	
Comments:					
Recommendations:	None specified				

Scale: 1:595	Position [m]	Code	Observation	MPEG	Photo	Grade
	0.00	ST	Start of survey	00:00:14		
	0.00	WL	Water level, 10% of sewer height	00:00:17		
	0.00	DEG	Debris grease, from 8 to 4 o'clock, 5% cross-sectional area loss	00:00:24		2
	0.00	MC	Sewer material changes: Polyvinyl chloride	00:00:27		
	3.00	DEG	Debris grease, from 8 to 4 o'clock, 10% cross-sectional area loss	00:00:39		3
	4.60	WL	Water level, 20% of sewer height	00:00:46		
	7.70	WL	Water level, 20% of sewer height	00:01:02		
	10.10	WL	Water level, 40% of sewer height	00:01:13		
	14.60	S1	CU	00:01:34	20b8fcea-598f-4eca-b584-d5b	
	18.00	F1	CU	00:01:49		
	18.90	WL	Water level, 40% of sewer height	00:01:54		
	34.40	WL	Water level, 25% of sewer height	00:03:11		
	41.00	WL	Water level, 20% of sewer height	00:03:47		
	46.30	WL	Water level, 30% of sewer height	00:04:12		
	68.40	FH	Finish survey: MH2	00:06:07	da90d75e-b133-4cf3-b8f6-96b	

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	2	2.0	0.0	3.0	3.0

Section Pictures - 09/12/2019 - MH1X

Section 1	Inspection Direction Downstream	PLR MH1X	Client's Job Ref 1	Contractor's Job Ref
--------------	------------------------------------	-------------	-----------------------	----------------------



_20b8fcea-598f-4eca-b584-d5b15450e5db.jpg, 00:01:34, 14.60 m
 Camera under water, Start



_da90d75e-b133-4cf3-b8f6-96bef0b27ae6.jpg, 00:06:07, 68.40 m
 Finish survey

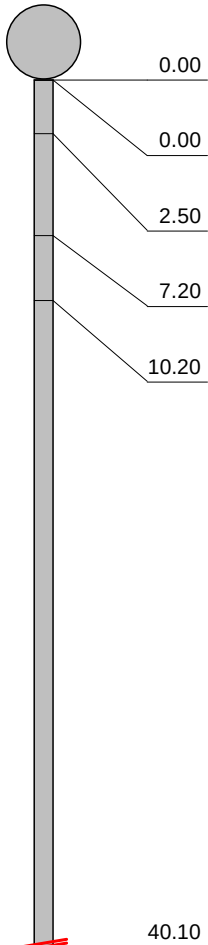
Section Inspection - 09/12/2019 - MH2X

Section 2	Inspection 1	Date 09/12/19	Time 11:20	Client's Job Ref 1	Weather Dry	Pre Cleaned No	PLR MH2X
Operator KL		Vehicle VEHICLE1		Camera Camera1	Preset Length Not Specified	Legal Status Not Specified	Alternative ID Not Specified

Town or Village:	Sports Village	Inspection Direction:	Downstream	Upstream Node:	MH2
Road:	West Starkey Street	Inspected Length:	40.10 m	Upstream Pipe Depth:	
Location:		Total Length:	40.10 m	Downstream Node:	MAIN LINE
Surface Type:	Unknown	Joint Length:	0.00 m	Downstream Pipe Depth:	
Use:	Combined	Pipe Shape:	Circular		
Type of Pipe:		Dia/Height:	225 mm		
Year Constructed:		Pipe Material:	Polyvinyl chloride		
Flow Control:		Lining:	No Lining		
Inspection Purpose:	Sample survey to determine asset condition		Lining Material:	No Lining	

Comments:

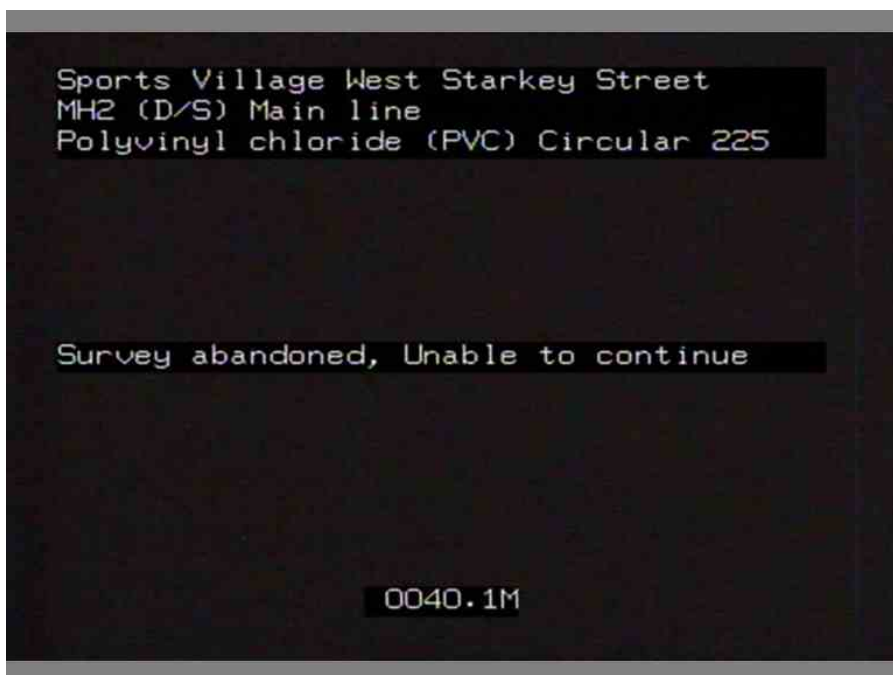
Recommendations: None specified

Scale: 1:349	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m MH2 						
	0.00	ST	Start of survey	00:00:16		
	0.00	WL	Water level, 10% of sewer height	00:00:18		
	2.50	WL	Water level, 20% of sewer height	00:00:41		
	7.20	WL	Water level, 40% of sewer height	00:01:05		
	10.20	CU	Camera under water	00:01:20		
	40.10	SA	Survey abandoned: Unable to continue	00:02:36	5be028d 9-a632-47 03-8953-5	

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

Section Pictures - 09/12/2019 - MH2X

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
2	Downstream	MH2X	1	



_5be028d9-a632-4703-8953-5a62462d7c11.jpg, 00:02:36, 40.10 m
 Survey abandoned



Manhole Record Card

Number	MH1	Date Of Survey	09/12/2019
Status	U	Function	C
		Type	M

Cover Details:

Square Recta ☒ Double Triang ☒ Single Triangl ☐ Circular ☐ Multiple ☐ Hinged ☐ Lockable ☐

CoverLevel Cover Load Class

Cover	600 X 600	Chamber	X 0	EvidenceOfSurcharge	☐
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	☐
Brick	☐	Precast Concrete	☒	PVC	☐
Reducing Slab	☐	Taper	☐	Side Entry	☐
		No.Land	0	Step Irons	☒
				Ladder	☒

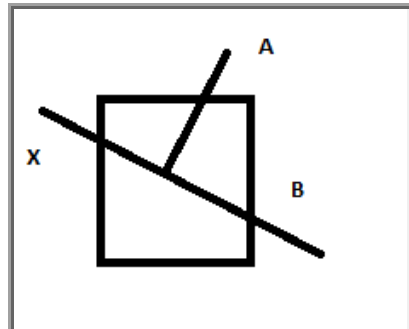
PlanPhoto



LocationPhoto



PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	DepthFr	UpstreamRe	Downstream	Pipe Sh	SizeHeight	SizeWidth	Pipe Material	Lin
A	-2.070	2.07	land drain		C		225	VC	
B	-1.100	1.10	upstream		C		150	PVC	
X	-2.100	2.10		MH2	C		225	VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.



Manhole Record Card

Number	MH2	Date Of Survey	09/12/2019
Status	U	Function	C
		Type	M

Cover Details:

Square Recta	☒	Double Triang	☐	Single Triangl	☐	Circular	☐	Multiple	☐	Hinged	☐	Lockable	☐
CoverLevel	0.00	Cover Load Class	H										

Cover	600	X	600	Chamber	1000	X	0	EvidenceOfSurcharge	☐
Shaft	0	X	0	ShaftDepth	0	ToxicAtmosphere	☐		
Brick	☐	Precast Concrete	☒	PVC	☐	Segments	☐	No.RegCourses	
Reducing Slab	☐	Taper	☐	Side Entry	☐	No.Land	0	Step Irons	☒
								Ladder	☐

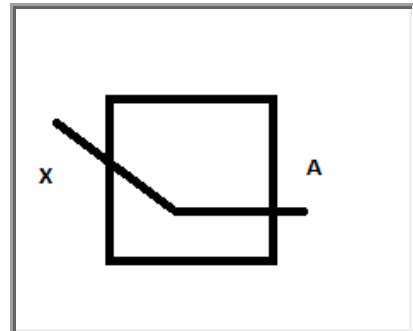
PlanPhoto



LocationPhoto



PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	DepthFr	UpstreamRe	Downstream	Pipe Sh	SizeHeight	SizeWidth	Pipe Material	Lin
A	-1.500	1.50	MH1		C		225	VC	
X	-1.540	1.54		MH3	C		225	VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.



Manhole Record Card

Number	MH4	Date Of Survey	09/12/2019
Status	PU	Function	C
		Type	M

Cover Details:

Square Recta ☒ Double Triang ☐ Single Triangl ☐ Circular ☐ Multiple ☐ Hinged ☒ Lockable ☐

CoverLevel Cover Load Class

Cover	500 X 540	Chamber	800 X 800	EvidenceOfSurcharge	☐
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	☐
Brick	☒	Precast Concrete	☐	PVC	☐
Reducing Slab	☐	Taper	☐	Side Entry	☐
		Segments	☐	No.RegCourses	
		No.Land	0	Step Irons	☐
				Ladder	☐

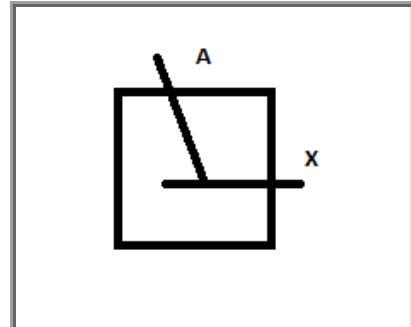
PlanPhoto



LocationPhoto



PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

MANHOLE APPEARS REDUNDANT

Pipe	Invert L	DepthFr	UpstreamRe	Downstream	Pipe Sh	SizeHeight	SizeWidth	Pipe Material	Lin
A	-1.130	1.13	?		C		150	VC	
X	-1.350	1.35		?	C		225	VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.



Manhole Record Card

Number	MH5	Date Of Survey	09/12/2019
Status	PR	Function	S
		Type	M

Cover Details:

Square Recta	☒	Double Triang	☐	Single Triangl	☐	Circular	☐	Multiple	☐	Hinged	☐	Lockable	☐
CoverLevel	0.00	Cover Load Class	H										

Cover	650	X	550	Chamber	1200	X	0	EvidenceOfSurcharge	☐
Shaft	0	X	0	ShaftDepth	0	ToxicAtmosphere	☐		
Brick	☐	Precast Concrete	☒	PVC	☐	Segments	☐	No.RegCourses	
Reducing Slab	☐	Taper	☐	Side Entry	☐	No.Land	0	Step Irons	☐
								Ladder	☐

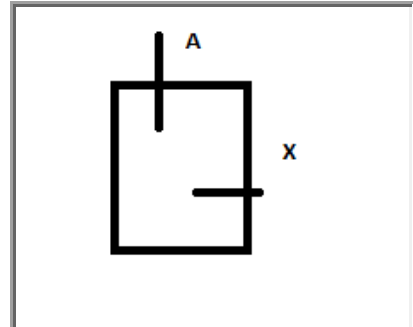
PlanPhoto



LocationPhoto



PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

CATCH PIT

Pipe	Invert L	DepthFr	UpstreamRe	Downstream	Pipe Sh	SizeHeight	SizeWidth	Pipe Material	Line
A	-1.460	1.46	land drain		C		225	PVC	
X	-1.460	1.46		land drain	C		225	PVC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.



Cripplegate Lane, Hoghton, Preston. PR5 0RR
Tel: 01254 851500 Fax: 01254854004 service@drain-alert.co.uk

Mott MacDonald
22 Station Road
Cambridge
CB1 2JD

12th December 2019

Dear Callum,

Reference: - JN29680, Heywood sports Village.

May we thank you for your valued custom. As requested, we have conducted a CCTV inspection at the above premises. We have emailed a link to you to access the Wincan VX video clips and documents via the cloud.

We trust that the report is to your satisfaction; however, should you have any queries then please do not hesitate to contact me.

Yours sincerely,

Mr S W Ormisher, B.A.(Hons.),
Technical Services Consultant

Service areas: Preston • Bolton • Wigan • Salford • Tameside • Rochdale • Cheshire • Fylde • Burnley
Company Reg. No. 029502950360 • Reg. No. 448 2116 57





Plan of the drainage system, not to scale

Enclosed

Conclusion

We attended site as requested to carry out a survey of the combined sewer which crosses the property within the area marked on the supplied drawing. The survey was conducted from manhole referenced MH1 downstream to manhole referenced MH3.

The sewer was found to be of polyvinyl chloride construction with a diameter of 225mm. From the survey footage it was noted that the sewer was flowing well but the constant water level did fluctuate along the length and then increased in depth until the camera was under water and the survey was abandoned. This was approximately 10mtrs short of MH3. The cover of MH3 was rusted and seized and as such was not able to be opened for inspection.

Recommendations

We recommend that MH3 is opened by grinding off the bolts to allow access for HPWJ using the tanker via the nearby back street, this should allow a full survey to be carried out enabling us to make a full appraisal of the sewer condition. We would estimate this to take approx. half a day. The back street has been marked on the plan as having raised bollards and access through these would need to be arranged.

We trust that the above is acceptable; however, should you require any further information, please do not hesitate to contact me.

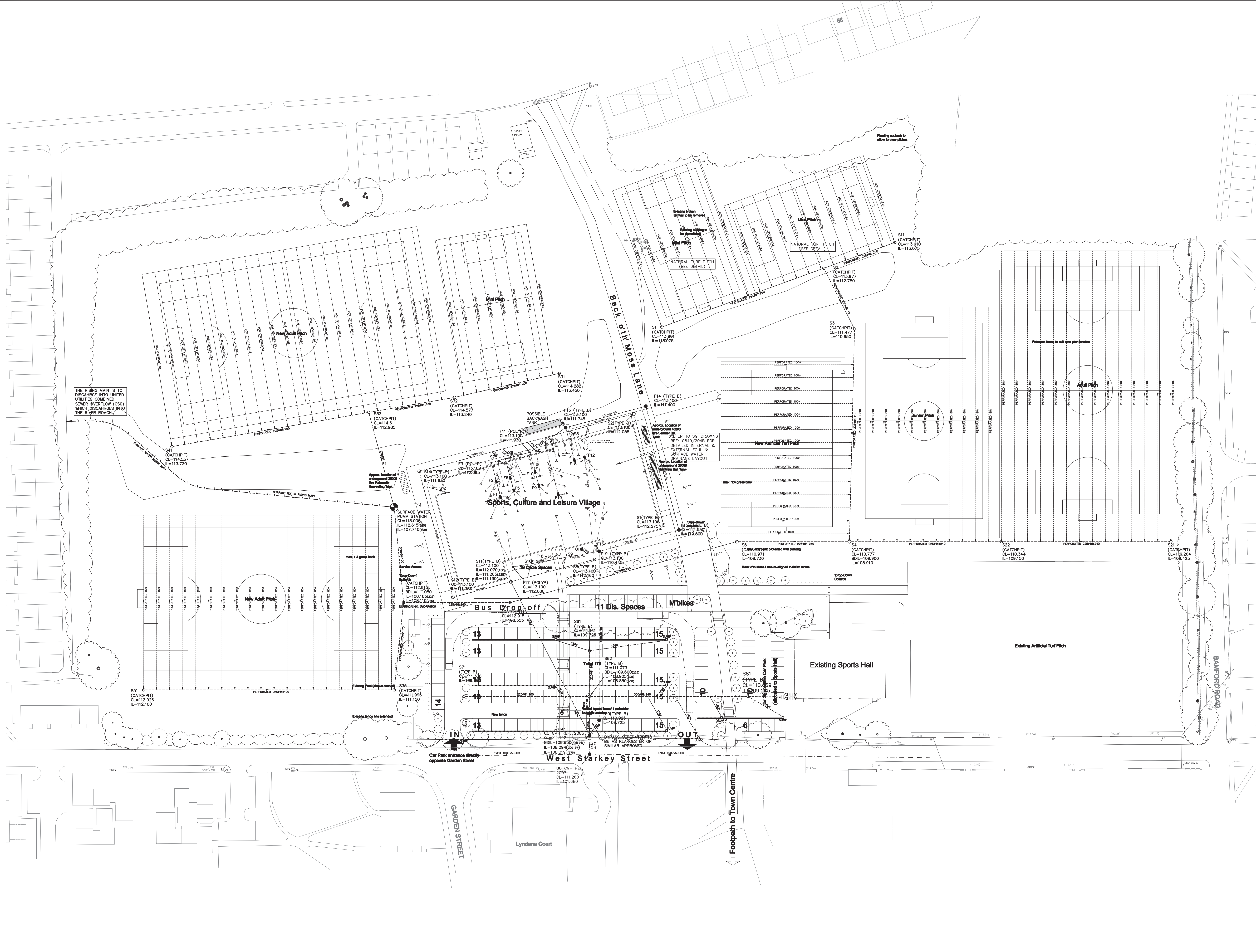
Yours sincerely,

Mr S W Ormisher,
Technical Services Consultant

Disclaimer - Please note that any dimensions, levels and drainage layout drawings that are provided by Drain Alert, should be checked before being relied upon. All updated



drawings are not to scale. It is the responsibility of the client to verify all information given with regards to the drainage prior to commencing any design or work site.

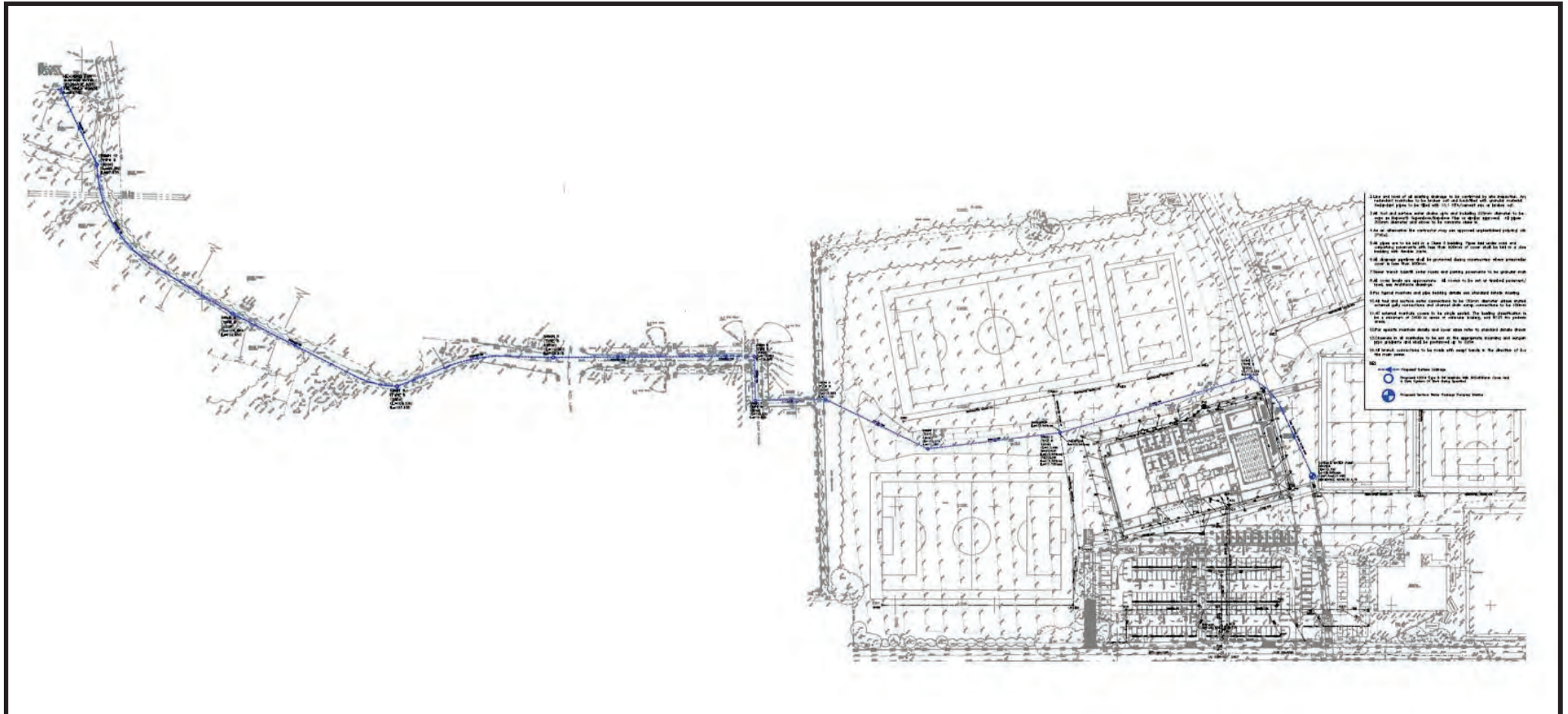


Heywood Sports Village.

Site Surface Water Investigations and Survey Works.

Completed on 27th May 2015.

By Anthony Owens from United Utilities Total Solutions.



Site Survey.

Purpose:

Our aim during the site survey was to ascertain if the surface water from the pitch areas did in fact discharged into the River Roch as was previous suggested and described by the construction plans supplied by Shepard and Gilmour. Please refer to the PDF attachments x 2.

Actions:

A full site survey that incorporated a local walk through whilst visually identifying any signs of recent construction activities and associated street furniture such as additional manholes, this also incorporated local residential knowledge of the completed contract.

To dye test from the surface water attenuation tank whilst discharging the contents to drain whilst observing the outlet point at the River Roch.

Conclusion:

I can confirm that the dyed surface water from the site attention tank did not have any connectivity to any UU's assets and did finally discharge into the River Roch.

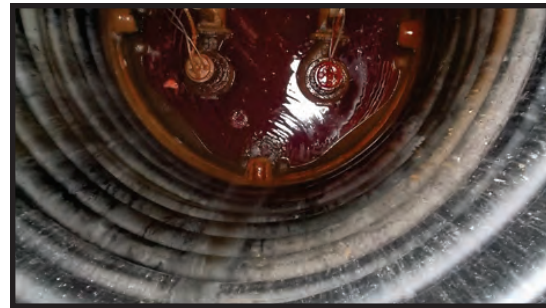
This is no longer a pitch and has been allowed to turn to scrub grass land

[illegible]

Conclusion.



When we originally found the outlet point at the River Roch, a small amount of flowing water could be seen and this was found to be fairly clear running water.



After introducing red dye into the attenuation surface water drainage tank, we ran three pumping cycles and monitored the discharge into the river for any colouration changes. Our pictures shows the final dyed water discharge into the river.



These pictures shows the discharge points of both the Heywood's surface water and UU's storm water drainage overflow sewers - please note these are positioned at opposite sides of the bridge.



B. Site Walkover Photographs

Photo 1: View north from southeast corner of site



Photo 2: View west along northern border of site



Photo 3: View south along western border of site



Photo 4: Fly tipping waste north west corner of site



Photo 5: Fly tipping waste north west corner of site



Photo 6: Household rubbish southwest corner of site



Photo 7: Household rubbish southwest corner of site



Photo 8: Building waste in southwest corner of site



Photo 9: Evidence of infilled ground (1/2)



Photo 10: Evidence of infilled ground (2/2)

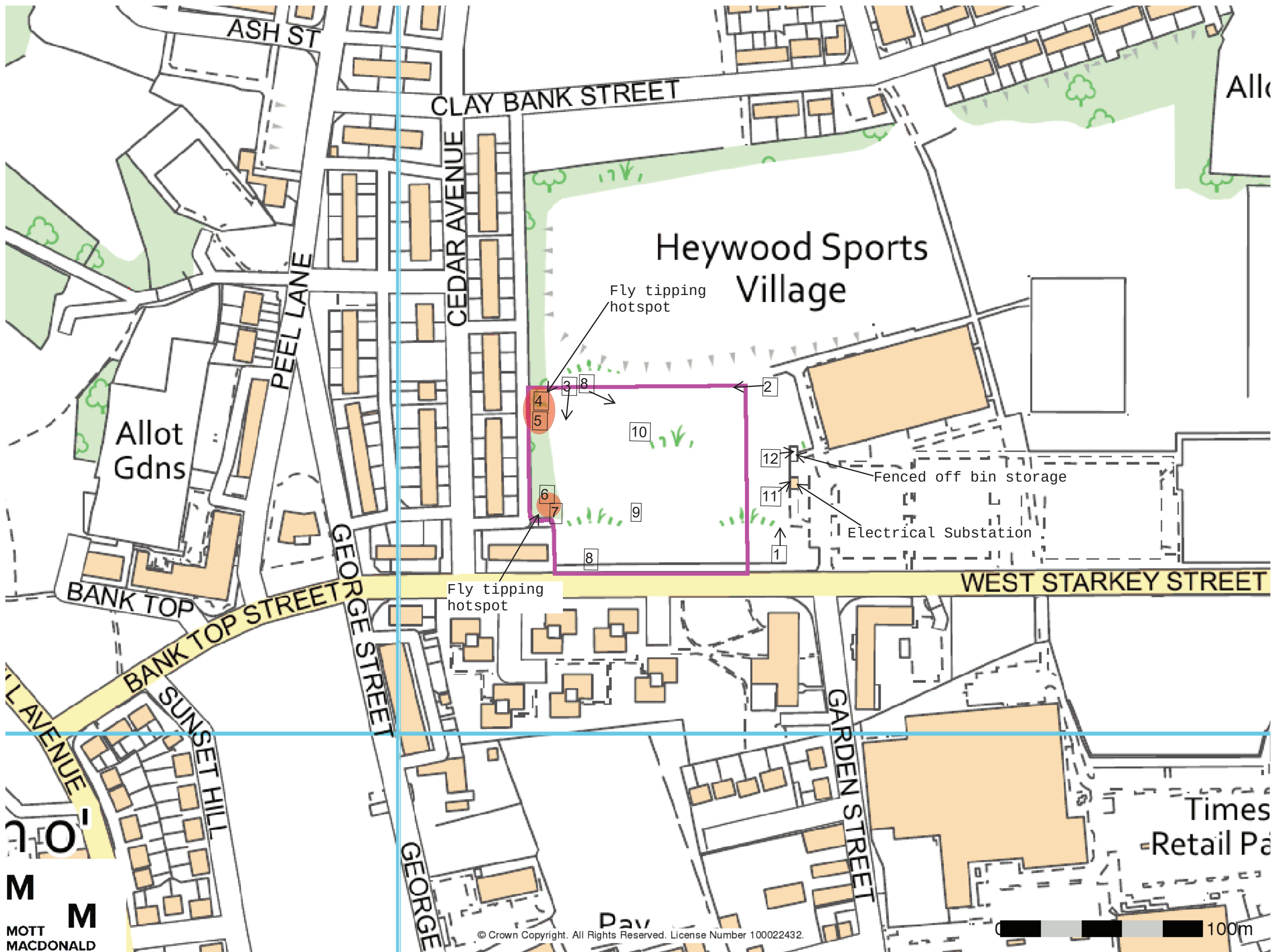


Photo 11: Electrical Substation



Photo 12: Fenced off bin storage





Appendix I – LLFA Correspondence

John Speers

From: Stephen McCann <Stephen.McCann@Rochdale.Gov.UK>
Sent: 17 July 2023 14:15
To: John Speers
Subject: Rochdale SEND School Heywood - OLD drain plans (Preapp 00146/21)

Categories: 223-018 - Rochdale SEND

Hello John,

Thanks for sending the higher resolution drawing. The first diagram is still only partially legible, but enough for me to see that in 2015, there was a functioning private SW drain, taking pumped drainage from the old football field.

I understand that what you are saying is that if the new SEND school was to use this private SW drain, a pumping system would be required. Therefore, one can argue that a more sustainable system is to send attenuated rainwater flows to public combined sewer. Your Drainage Strategy document would need to highlight this.

I also understand that UU have previously said that the development could be restricted to 5 l/s SW to combined sewer. This would appear to me to be more sustainable than pumping rainwater. I would still expect that parking areas would have permeable paving, to mitigate the volumes leaving the sites. Although permeability may be low with clay soils, the volume storage provision in the open graded sub-base allows for rainwater storage. Furthermore, land-drains in the carpark sub-base can also be added to drain any non-infiltrated water away, to prevent saturation.

regards

Stephen McCann
Drainage & Flooding Engineer
Network Improvement/Development/Flooding



☎ 01706 924606
📠 07552 570262
✉ stephen.mccann@rochdale.gov.uk

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

To access our services go to www.rochdale.gov.uk
For news, events and social media updates go to www.rochdale.gov.uk/newsandevents

Please consider the environment before printing this email.

From: John Speers <johnspeers@ajpltd.co.uk>
Sent: 17 July 2023 13:29
To: Stephen McCann <Stephen.McCann@Rochdale.Gov.UK>
Subject: RE: Query on resolution of drawing - Rochdale SEND School Heywood - OLD drain plans

Stephen,

See attached as requested.

Regards

John



John Speers

Associate

☎ 0151 227 1462

☎ 07841 832 409

✉ johnspeers@ajpltd.co.uk

📍 1 Dale St, Liverpool, L2 2ET

From: Stephen McCann <Stephen.McCann@Rochdale.Gov.UK>

Sent: 17 July 2023 13:21

To: John Speers <johnspeers@ajpltd.co.uk>

Subject: Query on resolution of drawing - Rochdale SEND School Heywood - OLD drain plans

Hello John,

I received your email this morning. I wonder:- do you have a copy of the appended document in a higher resolution?
I can't read any of the text upon it.

Stephen McCann

Drainage & Flooding Engineer

Network Improvement/Development/Flooding



☎ 01706 924606

☎ 07552 570262

✉ stephen.mccann@rochdale.gov.uk

From: John Speers <johnspeers@ajpltd.co.uk>

Sent: 17 July 2023 12:44

To: Stephen McCann <Stephen.McCann@Rochdale.Gov.UK>

Cc: Peter Bryan <peterbryan@ajpltd.co.uk>

Subject: RE: Rochdale SEND School Heywood - OLD drain plans

Hi Stephen,

Thanks for sending over the below info.

As discussed I have attached the latest outline drainage strategy drawing for the proposed school development. As you can see there is an existing private surface water drain to the north of the site, into which we would need to pump the surface water drainage from the development. I have also attached the 2no. pieces of contradicting information; a drawing which indicates that the private surface water drainage discharges into the UU combined water sewers to the west and a survey which indicates that this drainage discharges directly to the River Roch. The final attachment is the extracts from the SI which indicate that the site is underlain by peat and clays and as such soakaways are not viable for the site.

Ideally, from a sustainability and cost perspective, it would be better for the Client if the surface water drainage from the site could discharge into the UU combined water sewer to the west of the site (same location as the foul water connection) as this would remove the need for pumping the surface water and would also remove the requirement for the additional storage due to pumping. The maximum surface water discharge rate would be revised to 5.0 L/s, as per our discussions.

Can you please review and confirm if the LLFA would be happy for the development to discharge the surface water runoff from the proposed development into the UU combined water sewer to the west of the site, rather than having to pump the surface water runoff into the existing private surface water drainage to the north.

If you want to discuss anything further, please call me on my mobile number below.

Kind Regards

John



John Speers

Associate

☎ 0151 227 1462

☎ 07841 832 409

✉ johnspeers@ajpltd.co.uk

📍 1 Dale St, Liverpool, L2 2ET

From: Stephen McCann <Stephen.McCann@Rochdale.Gov.UK>

Sent: 14 July 2023 11:36

To: John Speers <johnspeers@ajpltd.co.uk>

Subject: Rochdale SEND School Heywood - OLD drain plans

Hello John,

Appended are the old plans within Council database. There is no record of any pipe sending SW to river Roch from the area of the new school.

As discussed, you'll send me extracts from old plans, which may indicate whether there is a SW drain to the west or not. I suspect that there is not one and you'll have to drain attenuated flows to combined sewer.

Stephen McCann

Drainage & Flooding Engineer

Network Improvement/Development/Flooding



☎ 01706 924606

☎ 07552 570262

✉ stephen.mccann@rochdale.gov.uk

Rochdale Borough Council

Floor 2, Number One Riverside

Smith Street, Rochdale, OL16 1XU

To access our services go to www.rochdale.gov.uk

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

Please consider the environment before printing this email.

From: John Speers <johnspeers@ajpltd.co.uk>
Sent: 13 July 2023 14:16
To: Stephen McCann <Stephen.McCann@Rochdale.Gov.UK>
Cc: Peter Bryan <peterbryan@ajpltd.co.uk>
Subject: RE: Rochdale SEND School Heywood

Hi Stephen,

Further to Michael's email below, would it be possible to have a quick 5 minute chat about the attached pre app advice and the overall drainage strategy for the proposed development. I am currently preparing an FRA & Drainage Strategy report for the site and want to make sure everything is in compliance with the LLFA's requirements prior to finalising.

If you could please give me a call on my mobile number below it would be greatly appreciated.

Kind Regards

John



John Speers
Associate

☎ 0151 227 1462
☎ 07841 832 409
✉ johnspeers@ajpltd.co.uk
📍 1 Dale St, Liverpool, L2 2ET

From: Michael Atkinson-Smith (He/him) <Michael.Atkinson-smith@Rochdale.Gov.UK>
Sent: 13 July 2023 12:23
To: John Speers <johnspeers@ajpltd.co.uk>
Cc: Peter Bryan <peterbryan@ajpltd.co.uk>; Stephen McCann <Stephen.McCann@Rochdale.Gov.UK>
Subject: RE: Rochdale SEND School Heywood

Hi John,

I don't currently work in the planning department but I've copied in our Drainage Officer, Stephen McCann, who will be happy to assist with any queries.

Kind regards,

Michael Atkinson-Smith
Senior Project Officer (Heritage)

Phone: 01706 925976

Number One Riverside, Smith Street, Rochdale OL16 1XU
www.investinrochdale.co.uk

Rochdale Development Agency: a local authority controlled company of Rochdale Borough Council.
Registered in England: 2819935. Registered Office: Number One Riverside, Smith Street, Rochdale OL16 1XU.

From: John Speers <johnspeers@ajpltd.co.uk>
Sent: 12 July 2023 14:51
To: Michael Atkinson-Smith (He/him) <Michael.Atkinson-smith@Rochdale.Gov.UK>
Cc: Peter Bryan <peterbryan@ajpltd.co.uk>
Subject: Rochdale SEND School Heywood

:CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Afternoon Michael,

I am working on the Rochdale SEND School project in Heywood and I was passed the attached pre app advice which has your details on it. I am working specifically on the flood risk and drainage side of the project and was hoping you could point me in the direction of a Drainage and Flooding Officer who could answer a few questions for me? I tried to call but unfortunately it rang out.

Is this something you can help with? If you want to chat through anything please give me a call, my details are below.

Kind Regards

John



John Speers
Associate

☎ 0151 227 1462

☎ 07841 832 409

✉ johnspeers@ajpltd.co.uk

📍 1 Dale St, Liverpool, L2 2ET

This email, its contents and any attachments are intended only for the above named. As the email may contain confidential and/or legally privileged information, if you are not, or suspect that you are not, the above named or the person responsible for delivery of the message to the above named, please delete or destroy the email and any attachments immediately and inform the sender of the error. Unauthorised access, use, disclosure, storage or copying is not permitted and may be unlawful. The views of the author may not necessarily reflect those of Rochdale Borough Council.

Rochdale Borough Council undertakes monitoring of both incoming and outgoing e-mails. You should therefore be aware that if you send an e-mail to a person within Rochdale Borough Council it may be subject to any monitoring

deemed necessary by Rochdale Borough Council from time to time. Rochdale Borough Council cannot guarantee that this message or any attachment is virus free or has not been intercepted and amended.

As a public body, Rochdale Borough Council may be required to disclose this email (or any response to it) under the Freedom of Information Act 2000, unless the information in it is covered by one of the exemptions within the Act.

This email, its contents and any attachments are intended only for the above named. As the email may contain confidential and/or legally privileged information, if you are not, or suspect that you are not, the above named or the person responsible for delivery of the message to the above named, please delete or destroy the email and any attachments immediately and inform the sender of the error. Unauthorised access, use, disclosure, storage or copying is not permitted and may be unlawful. The views of the author may not necessarily reflect those of Rochdale Borough Council.

Rochdale Borough Council undertakes monitoring of both incoming and outgoing e-mails. You should therefore be aware that if you send an e-mail to a person within Rochdale Borough Council it may be subject to any monitoring deemed necessary by Rochdale Borough Council from time to time. Rochdale Borough Council cannot guarantee that this message or any attachment is virus free or has not been intercepted and amended.

As a public body, Rochdale Borough Council may be required to disclose this email (or any response to it) under the Freedom of Information Act 2000, unless the information in it is covered by one of the exemptions within the Act.

This email, its contents and any attachments are intended only for the above named. As the email may contain confidential and/or legally privileged information, if you are not, or suspect that you are not, the above named or the person responsible for delivery of the message to the above named, please delete or destroy the email and any attachments immediately and inform the sender of the error. Unauthorised access, use, disclosure, storage or copying is not permitted and may be unlawful. The views of the author may not necessarily reflect those of Rochdale Borough Council.

Rochdale Borough Council undertakes monitoring of both incoming and outgoing e-mails. You should therefore be aware that if you send an e-mail to a person within Rochdale Borough Council it may be subject to any monitoring deemed necessary by Rochdale Borough Council from time to time. Rochdale Borough Council cannot guarantee that this message or any attachment is virus free or has not been intercepted and amended.

As a public body, Rochdale Borough Council may be required to disclose this email (or any response to it) under the Freedom of Information Act 2000, unless the information in it is covered by one of the exemptions within the Act.

This email, its contents and any attachments are intended only for the above named. As the email may contain confidential and/or legally privileged information, if you are not, or suspect that you are not, the above named or the person responsible for delivery of the message to the above named, please delete or destroy the email and any attachments immediately and inform the sender of the error. Unauthorised access, use, disclosure, storage or copying is not permitted and may be unlawful. The views of the author may not necessarily reflect those of Rochdale Borough Council.

Rochdale Borough Council undertakes monitoring of both incoming and outgoing e-mails. You should therefore be aware that if you send an e-mail to a person within Rochdale Borough Council it may be subject to any monitoring deemed necessary by Rochdale Borough Council from time to time. Rochdale Borough Council cannot guarantee that this message or any attachment is virus free or has not been intercepted and amended.

As a public body, Rochdale Borough Council may be required to disclose this email (or any response to it) under the Freedom of Information Act 2000, unless the information in it is covered by one of the exemptions within the Act.

Appendix J – Greenfield Runoff Calculations

The Alan Johnston Partnership		Page 1
1 Dale Street Liverpool L2 2ET	223-018 - Rochdale SEND Greenfield Runoff Rates	
Date 25/07/2023 15:41 File	Designed by JRS Checked by PB	
XP Solutions	Source Control 2019.1	

ICP SUDS Mean Annual Flood

Input

Return Period (years) 1 SAAR (mm) 1125 Urban 0.000
Area (ha) 0.591 Soil 0.450 Region Number Region 10

Results l/s

QBAR Rural 4.5
QBAR Urban 4.5

Q1 year 3.9

Q1 year 3.9
Q30 years 7.7
Q100 years 9.4

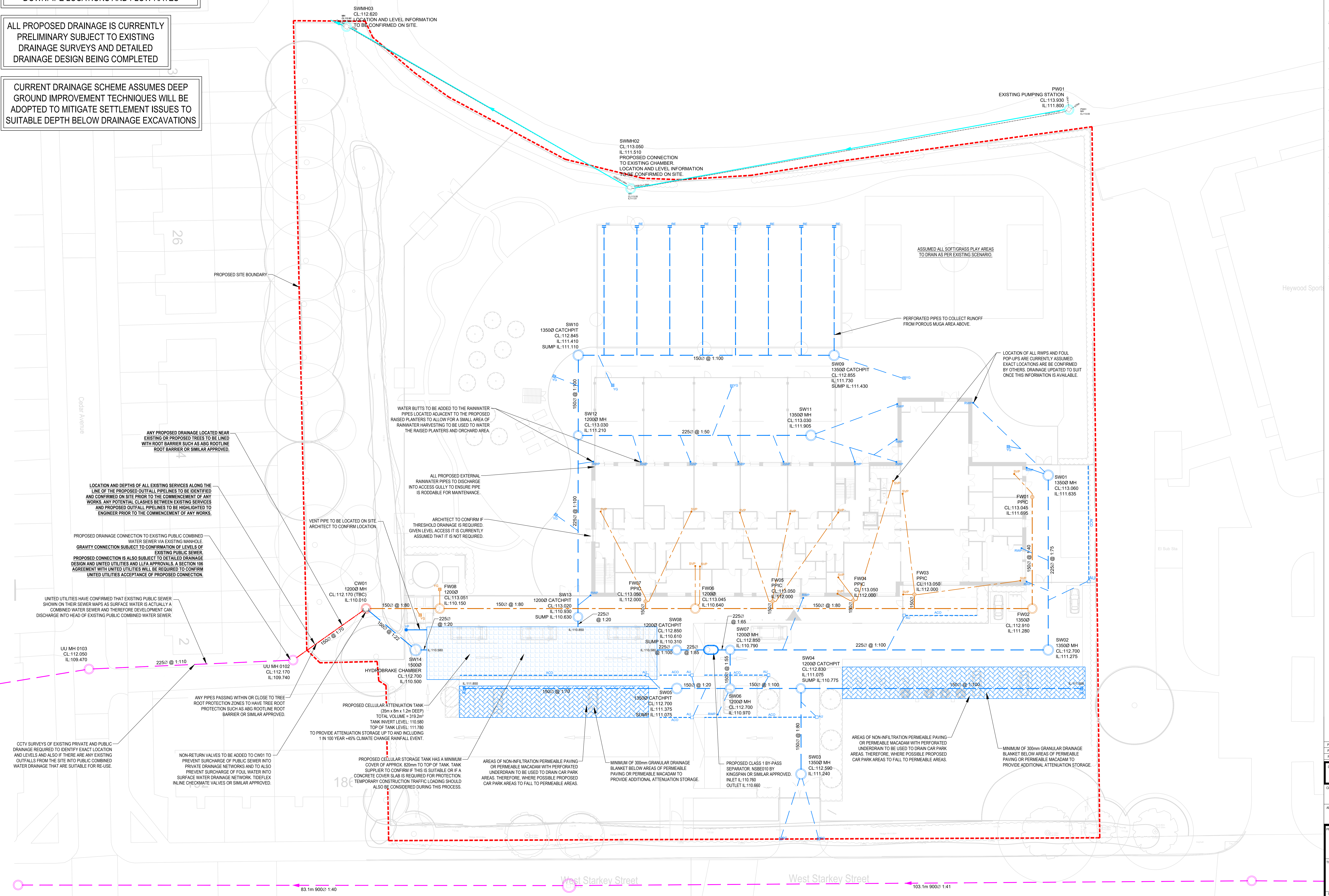
Appendix K – Outline Drainage Strategy Drawing & SW Calculations

PRELIMINARY SUBJECT TO CONFIRMATION OF UNITED UTILITIES AND ROCHDALE BOROUGH COUNCIL ACCEPTANCE OF DISCHARGE CONNECTION LOCATIONS AND FLOW RATES

PRELIMINARY SUBJECT TO CONFIRMATION OF LANDSCAPE ARCHITECTS PROPOSED SITE LEVELS AND ALL FOUL WATER POP UP AND RAINWATER DOWNPIPE LOCATIONS AND FLOW RATES

ALL PROPOSED DRAINAGE IS CURRENTLY PRELIMINARY SUBJECT TO EXISTING DRAINAGE SURVEYS AND DETAILED DRAINAGE DESIGN BEING COMPLETED

CURRENT DRAINAGE SCHEME ASSUMES DEEP GROUND IMPROVEMENT TECHNIQUES WILL BE ADOPTED TO MITIGATE SETTLEMENT ISSUES TO SUITABLE DEPTH BELOW DRAINAGE EXCAVATIONS



- ### GENERAL NOTES
- SETTING OUT SHALL BE UNDERTAKEN USING ONLY THE INFORMATION GIVEN. DISTANCES SHOULD NOT BE SCALED FROM THIS DRAWING
 - ALL SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SEWERS FOR ADOPTION 8TH EDITION AND UNITED UTILITIES DETAILS & GUIDELINES
 - THE MINIMUM GRAVITY PIPE DIAMETER UNDER ADOPTABLE HIGHWAYS SHALL BE 150mm
 - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL INFORMATION GIVEN WITH REGARDS TO EXISTING SERVICES AND DRAINAGE CONNECTIONS ETC. PRIOR TO COMMENCING THE WORKS. THE RATES SHALL INCLUDE FOR HAND DIG AROUND SERVICES WHERE NECESSARY. THE CONTRACTOR SHALL ADHERE TO THE COM REGULATIONS AT ALL TIMES
 - THE OUTSIDES OF ALL SEWERS SHALL BE A MINIMUM OF 1.0m FROM KERB LINES AND THE OUTSIDE OF MANHOLES SHALL BE A MINIMUM OF 0.5m FROM KERB LINES
 - EXISTING FLOWS IN WATERCOURSES, SEWERS AND LAND DRAINS SHALL BE MAINTAINED AT ALL TIMES
 - ONLY TRAINED PERSONNEL SHALL BE PERMITTED TO ENTER CONFINED SPACES
 - ALL MATERIALS TO BEAR THE RELEVANT B.S. KITEMARK AND COMPLY FULLY WITH THE SPECIFICATIONS. ALL CONCRETE & CONCRETE PRODUCTS MUST USE SULPHATE RESISTANT CEMENT UNLESS THE SITE INVESTIGATION REPORT PROVES THAT SULPHATE ATTACK FROM SOILS AND GROUNDWATER WILL NOT OCCUR TO WITHSTAND A CLASS
 - ALL OPENING NOTICES ETC. AS REQUIRED UNDER HIGHWAYS ACTS ETC. ARE TO BE OBTAINED PRIOR TO COMMENCEMENT OF WORKS. ALL WORKS ARE TO BE INSPECTED BY L.A., NHBC OR THE NETWORK OPERATOR AS APPLICABLE
 - WHERE ULTRA RIF UPVC PIPES (OR SIMILAR APPROVED) ARE USED IN ADOPTABLE DRAINAGE THEY SHALL STILL BE HANDLED AND LAD IN ACCORDANCE WITH THE SPECIFICATION AND GUIDANCE ISSUED BY THE HIGH PERFORMANCE PIPE ASSOCIATION
 - ALL CLASS 5 BED AND SURROUND MUST BE USED FOR SUCH PIPES. TRENCH BACKFILL IN HIGHWAYS TO WITHIN 1M OF HIGHWAY SHALL, AS DIRECTED BY THE HIGHWAY AUTHORITY BE A SUITABLE GRANULAR MATERIAL ALL IN ACCORDANCE WITH SEWERS FOR ADOPTION CL 4.3.4
 - SUB SLAB LEVELS SHALL NOT BE VARIED WITHOUT REFERENCE TO THE ENGINEER FOR GUIDANCE
 - ALL GULLY CONNECTIONS TO BE 150mm VITRIFIED CLAY UNLESS NOTED OTHERWISE
 - THE LOCATION AND ORIENTATION OF ALL RECESSED COVERS IN BLOCK PAVING AREAS TO BE COORDINATED WITH BLOCK PAVING PATTERN
 - SLOW REST BENDS TO BE USED IN ALL LOCATIONS MADE UP FROM 2No. 45 DEG BENDS (600mm)
 - MANHOLE POSITIONS AND ACCESS COVERS TO BE ACCURATELY SET-OUT BY LANDSCAPE ARCHITECT TO SUIT EXTERNAL FINISHES
 - ALL DRAINS CAST THROUGH FOUNDATIONS TO HAVE ROCKER PIPES ON BOTH SIDES OF FOUNDATION
 - ALL POP UP POSITIONS TO BE CONFIRMED SET OUT DIMENSIONS TO BE AGREED & PROVIDED BY OTHERS
 - ALL DISCHARGE RATES TO BE CONFIRMED BY M&E DESIGNER
 - ALL SURFACE WATER COLLECTION FEATURES TO BE CONFIRMED BY THE LANDSCAPE ARCHITECT
 - STORAGE HAS BEEN PROVIDED IN A CELLULAR STORAGE TANK AND UP-SIZED MANHOLES AND PIPES
 - EXISTING SEWER DEPTHS TO BE CONFIRMED PRIOR TO CONSTRUCTION OF ANY DRAINAGE WORKS
 - LANDSCAPE ARCHITECT TO CONFIRM GULLY AND DRAINAGE CHANNEL LOCATIONS TO LANDSCAPED AREAS
 - FOUL NETWORK TO BE CONFIRMED FOLLOWING CONFIRMATION OF BRANCH CONNECTION POINTS FROM BUILDING M&E DESIGNER

- ### DRAINAGE NOTES
- ALL SURFACE / FOUL WATER CONNECTIONS ARE TO HAVE ROADABLE ACCESS FROM ABOVE GROUND
 - ALL POP UP AND RWP SETTING OUT IS TO BE PROVIDED BY THE ARCHITECT
 - FINAL POP UP LOCATIONS SUBJECT TO ARCHITECT / M&E CO-ORDINATION
 - ROAD DRAINAGE SUBJECT TO CHANGE FOLLOWING CONFIRMATION OF PROPOSED ROAD LEVELS AND FALLS

LEGEND

	PROPOSED FOUL WATER MANHOLE
	PROPOSED SURFACE WATER MANHOLE
	PROPOSED COMBINED WATER MANHOLE
	PROPOSED FOUL WATER PPIC
	PROPOSED SURFACE WATER PPIC
	PROPOSED FOUL WATER DRAINAGE
	PROPOSED SURFACE WATER DRAINAGE
	PROPOSED COMBINED WATER DRAINAGE
	PROPOSED PERFORATED PIPES WITH RODDING EYE
	PROPOSED LINEAR DRAINAGE (ACO) CHANNEL WITH ACCESS UNIT
	PROPOSED CELLULAR ATTENUATION TANK
	PROPOSED PERMEABLE PAVING/POROUS TARMAC/GRAVEL
	VENT PIPE
	PROPOSED ROAD GULLY
	PROPOSED YARD GULLY
	EXISTING PRIVATE SURFACE WATER DRAINAGE TO REMAIN
	EXISTING PUBLIC COMBINED WATER DRAINAGE
	SITE BOUNDARY

NO	10.08.2023	PRELIMINARY ISSUE - UPDATED TO SUIT REVISED SURFACE WATER OUTFALL LOCATION	JJR	JRS	PN
PSI	13.08.2023	PRELIMINARY ISSUE	JJR	JRS	PN
REV	DATE	DESCRIPTION	BY	CHK	APP

DRAWING STATUS: **PRELIMINARY**

CLIENT: TILBURY DOUGLAS

ARCHITECT: ELLIS WILLIAMS ARCHITECTS

PROJECT: ROCHDALE SEND HEYWOOD

TITLE: BELOW GROUND DRAINAGE OUTLINE DRAINAGE STRATEGY

STATUS	PROJECT No.	PROJECT	ORIGINATOR	VOL/REV/LEVEL	TYPE	SCALE	DRAWING No.	REV
S2	223-018	FS0911-AJP-ZZ-00-D	C	1000	P02			

SCALE @ 1:200

DESIGNED: JRS

DRAWN: JJR

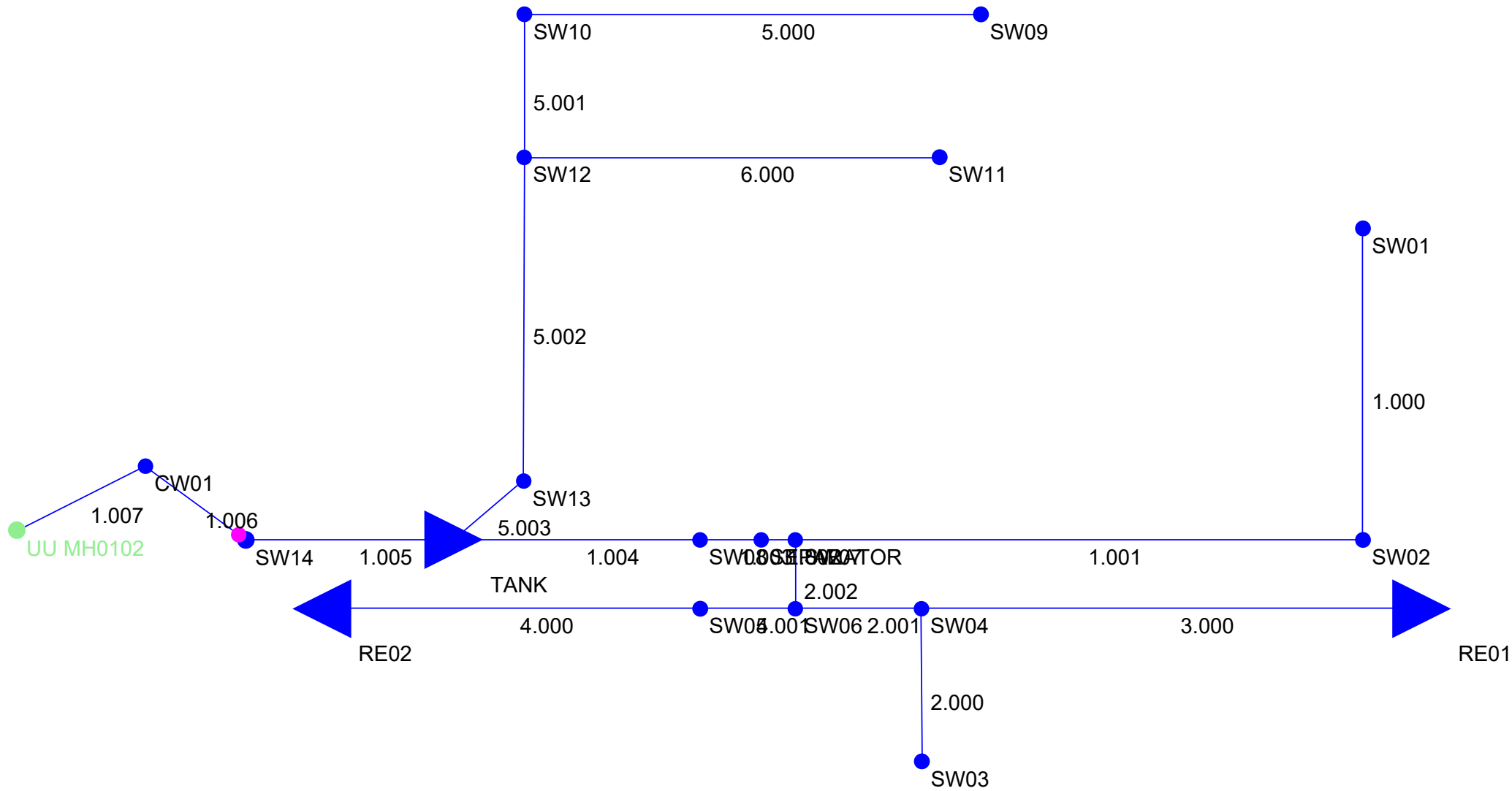
CHECKED: JRS

APPROVED: PS

DATE: JUN 2023

AJP consulting engineers

0151 227 1462 85 info@ajpjd.co.uk 01 Dale Street, Liverpool, L2 2ET



The Alan Johnston Partnership		Page 1
1 Dale Street Liverpool L2 2ET	223-018 Rochdale SEND SW Network	
Date 09/08/2023 16:42 File SW NETWORK.MDX	Designed by JRS Checked by PB	
Micro Drainage	Network 2019.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	30	PIMP (%)	100
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0
Ratio R	0.281	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.211	4-8	0.206

Total Area Contributing (ha) = 0.417

Total Pipe Volume (m³) = 11.224

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	26.560	0.360	73.8	0.084	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	48.382	0.485	99.8	0.020	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	13.014	0.165	78.9	0.025	5.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	42.630	0.425	100.3	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
2.001	10.752	0.106	101.6	0.033	0.00	0.0	0.600	o	150	Pipe/Conduit	
4.000	32.244	0.475	67.9	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.29	111.635	0.084	0.0	0.0	0.0	1.52	60.6	11.4
1.001	50.00	5.91	111.275	0.104	0.0	0.0	0.0	1.31	52.0	14.1
2.000	50.00	5.19	111.240	0.025	0.0	0.0	0.0	1.13	20.0	3.4
3.000	50.00	5.71	111.500	0.000	0.0	0.0	0.0	1.00	17.7	0.0
2.001	50.00	5.89	111.075	0.058	0.0	0.0	0.0	1.00	17.6	7.9
4.000	50.00	5.44	111.850	0.000	0.0	0.0	0.0	1.22	21.6	0.0

The Alan Johnston Partnership		Page 2
1 Dale Street Liverpool L2 2ET	223-018 Rochdale SEND SW Network	
Date 09/08/2023 16:42 File SW NETWORK.MDX	Designed by JRS Checked by PB	
Micro Drainage	Network 2019.1	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
4.001	8.100	0.406	20.0	0.060	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.002	5.865	0.104	56.2	0.002	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	2.907	0.030	98.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	5.211	0.050	105.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	20.993	0.030	700.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.000	38.905	0.395	98.5	0.065	5.00	0.0	0.600	o	150	Pipe/Conduit	
5.001	12.204	0.125	97.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
6.000	35.408	0.695	50.9	0.101	5.00	0.0	0.600	o	225	Pipe/Conduit	
5.002	27.593	0.280	98.4	0.027	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.003	7.783	0.080	97.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	17.717	0.080	221.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.006	10.613	0.489	21.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.007	12.248	0.175	70.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.001	50.00	5.50	111.375	0.060	0.0	0.0	0.0	2.27	40.0	8.1
2.002	50.00	5.96	110.969	0.120	0.0	0.0	0.0	1.34	23.8	16.2
1.002	50.00	6.00	110.790	0.224	0.0	0.0	0.0	1.32	52.5	30.3
1.003	50.00	6.07	110.660	0.224	0.0	0.0	0.0	1.28	50.7	30.3
1.004	50.00	6.78	110.610	0.224	0.0	0.0	0.0	0.49	19.4	30.3
5.000	50.00	5.64	111.805	0.065	0.0	0.0	0.0	1.01	17.9	8.8
5.001	50.00	5.84	111.410	0.065	0.0	0.0	0.0	1.02	18.0	8.8
6.000	50.00	5.32	111.905	0.101	0.0	0.0	0.0	1.84	73.0	13.7
5.002	50.00	6.19	111.210	0.193	0.0	0.0	0.0	1.32	52.4	26.1
5.003	50.00	6.29	110.930	0.193	0.0	0.0	0.0	1.33	52.7	26.1
1.005	50.00	7.12	110.580	0.417	0.0	0.0	0.0	0.88	34.8	56.5
1.006	50.00	7.20	110.500	0.417	0.0	0.0	0.0	2.17	38.4	56.5
1.007	50.00	7.33	110.010	0.417	0.0	0.0	0.0	1.57	62.2	56.5

Manhole Schedules for Storm											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
SW01	113.060	1.425	Open Manhole	1350	1.000	111.635	225				
SW02	112.700	1.425	Open Manhole	1350	1.001	111.275	225	1.000	111.275	225	
SW03	112.590	1.350	Open Manhole	1350	2.000	111.240	150				
RE01	112.250	0.750	Open Manhole	150	3.000	111.500	150				
SW04	112.830	1.755	Open Manhole	1200	2.001	111.075	150	2.000	111.075	150	
								3.000	111.075	150	
RE02	112.600	0.750	Open Manhole	150	4.000	111.850	150				
SW05	112.700	1.325	Open Manhole	1350	4.001	111.375	150	4.000	111.375	150	
SW06	112.700	1.731	Open Manhole	1200	2.002	110.969	150	2.001	110.969	150	
								4.001	110.969	150	
SW07	112.850	2.060	Open Manhole	1200	1.002	110.790	225	1.001	110.790	225	
								2.002	110.865	150	
SEPARATOR	112.850	2.190	Open Manhole	1200	1.003	110.660	225	1.002	110.760	225	100
SW08	112.850	2.240	Open Manhole	1200	1.004	110.610	225	1.003	110.610	225	
SW09	112.855	1.050	Open Manhole	1350	5.000	111.805	150				
SW10	112.845	1.435	Open Manhole	1350	5.001	111.410	150	5.000	111.410	150	
SW11	113.030	1.125	Open Manhole	1350	6.000	111.905	225				
SW12	113.030	1.820	Open Manhole	1200	5.002	111.210	225	5.001	111.285	150	
								6.000	111.210	225	
SW13	113.020	2.090	Open Manhole	1200	5.003	110.930	225	5.002	110.930	225	
TANK	112.600	2.020	Open Manhole	1200	1.005	110.580	225	1.004	110.580	225	
								5.003	110.850	225	270
SW14	112.700	2.200	Open Manhole	1500	1.006	110.500	150	1.005	110.500	225	
CW01	112.170	2.160	Open Manhole	1200	1.007	110.010	225	1.006	110.011	150	
UU MH0102	112.170	2.335	Open Manhole	1500		OUTFALL		1.007	109.835	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SW01	385176.670	411135.492	385176.670	411135.492	Required	
SW02	385176.670	411108.932	385176.670	411108.932	Required	
SW03	385139.073	411090.052	385139.073	411090.052	Required	
RE01	385181.669	411103.067	385181.669	411103.067	Required	
SW04	385139.039	411103.067	385139.039	411103.067	Required	
RE02	385087.944	411103.067	385087.944	411103.067	Required	

The Alan Johnston Partnership		Page 4
1 Dale Street Liverpool L2 2ET	223-018 Rochdale SEND SW Network	
Date 09/08/2023 16:42 File SW NETWORK.MDX	Designed by JRS Checked by PB	
Micro Drainage	Network 2019.1	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SW05	385120.187	411103.067	385120.187	411103.067	Required	
SW06	385128.287	411103.067	385128.287	411103.067	Required	
SW07	385128.287	411108.932	385128.287	411108.932	Required	
SEPARATOR	385125.381	411108.936	385125.381	411108.936	Required	
SW08	385120.170	411108.932	385120.170	411108.932	Required	
SW09	385144.107	411153.741	385144.107	411153.741	Required	
SW10	385105.202	411153.748	385105.202	411153.748	Required	
SW11	385140.589	411141.562	385140.589	411141.562	Required	
SW12	385105.181	411141.545	385105.181	411141.545	Required	
SW13	385105.144	411113.952	385105.144	411113.952	Required	
TANK	385099.177	411108.955	385099.177	411108.955	Required	
SW14	385081.460	411108.932	385081.460	411108.932	Required	
CW01	385072.911	411115.222	385072.911	411115.222	Required	
UU MH0102	385061.947	411109.764			No Entry	

The Alan Johnston Partnership		Page 5
1 Dale Street Liverpool L2 2ET	223-018 Rochdale SEND SW Network	
Date 09/08/2023 16:42 File SW NETWORK.MDX	Designed by JRS Checked by PB	
Micro Drainage	Network 2019.1	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	SW01	113.060	111.635	1.200	Open Manhole	1350
1.001	o	225	SW02	112.700	111.275	1.200	Open Manhole	1350
2.000	o	150	SW03	112.590	111.240	1.200	Open Manhole	1350
3.000	o	150	RE01	112.250	111.500	0.600	Open Manhole	150
2.001	o	150	SW04	112.830	111.075	1.605	Open Manhole	1200
4.000	o	150	RE02	112.600	111.850	0.600	Open Manhole	150
4.001	o	150	SW05	112.700	111.375	1.175	Open Manhole	1350
2.002	o	150	SW06	112.700	110.969	1.581	Open Manhole	1200
1.002	o	225	SW07	112.850	110.790	1.835	Open Manhole	1200
1.003	o	225	SEPARATOR	112.850	110.660	1.965	Open Manhole	1200
1.004	o	225	SW08	112.850	110.610	2.015	Open Manhole	1200
5.000	o	150	SW09	112.855	111.805	0.900	Open Manhole	1350
5.001	o	150	SW10	112.845	111.410	1.285	Open Manhole	1350
6.000	o	225	SW11	113.030	111.905	0.900	Open Manhole	1350
5.002	o	225	SW12	113.030	111.210	1.595	Open Manhole	1200
5.003	o	225	SW13	113.020	110.930	1.865	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	26.560	73.8	SW02	112.700	111.275	1.200	Open Manhole	1350
1.001	48.382	99.8	SW07	112.850	110.790	1.835	Open Manhole	1200
2.000	13.014	78.9	SW04	112.830	111.075	1.605	Open Manhole	1200
3.000	42.630	100.3	SW04	112.830	111.075	1.605	Open Manhole	1200
2.001	10.752	101.6	SW06	112.700	110.969	1.581	Open Manhole	1200
4.000	32.244	67.9	SW05	112.700	111.375	1.175	Open Manhole	1350
4.001	8.100	20.0	SW06	112.700	110.969	1.581	Open Manhole	1200
2.002	5.865	56.2	SW07	112.850	110.865	1.835	Open Manhole	1200
1.002	2.907	98.0	SEPARATOR	112.850	110.760	1.865	Open Manhole	1200
1.003	5.211	105.0	SW08	112.850	110.610	2.015	Open Manhole	1200
1.004	20.993	700.0	TANK	112.600	110.580	1.795	Open Manhole	1200
5.000	38.905	98.5	SW10	112.845	111.410	1.285	Open Manhole	1350
5.001	12.204	97.6	SW12	113.030	111.285	1.595	Open Manhole	1200
6.000	35.408	50.9	SW12	113.030	111.210	1.595	Open Manhole	1200
5.002	27.593	98.4	SW13	113.020	110.930	1.865	Open Manhole	1200
5.003	7.783	97.2	TANK	112.600	110.850	1.525	Open Manhole	1200

The Alan Johnston Partnership		Page 6
1 Dale Street Liverpool L2 2ET	223-018 Rochdale SEND SW Network	
Date 09/08/2023 16:42 File SW NETWORK.MDX	Designed by JRS Checked by PB	
Micro Drainage	Network 2019.1	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.005	o	225	TANK	112.600	110.580	1.795	Open Manhole	1200
1.006	o	150	SW14	112.700	110.500	2.050	Open Manhole	1500
1.007	o	225	CW01	112.170	110.010	1.935	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.005	17.717	221.0	SW14	112.700	110.500	1.975	Open Manhole	1500
1.006	10.613	21.7	CW01	112.170	110.011	2.009	Open Manhole	1200
1.007	12.248	70.0	UU MH0102	112.170	109.835	2.110	Open Manhole	1500

The Alan Johnston Partnership		Page 7
1 Dale Street Liverpool L2 2ET	223-018 Rochdale SEND SW Network	
Date 09/08/2023 16:42 File SW NETWORK.MDX	Designed by JRS Checked by PB	
Micro Drainage	Network 2019.1	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.084	0.084	0.084
1.001	-	-	100	0.020	0.020	0.020
2.000	-	-	100	0.025	0.025	0.025
3.000	-	-	100	0.000	0.000	0.000
2.001	-	-	100	0.033	0.033	0.033
4.000	-	-	100	0.000	0.000	0.000
4.001	-	-	100	0.060	0.060	0.060
2.002	-	-	100	0.002	0.002	0.002
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.065	0.065	0.065
5.001	-	-	100	0.000	0.000	0.000
6.000	-	-	100	0.101	0.101	0.101
5.002	-	-	100	0.027	0.027	0.027
5.003	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.417	0.417	0.417

Free Flowing Outfall Details for Storm

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

1.007	UU MH0102	112.170	109.835	109.740	1500	0
-------	-----------	---------	---------	---------	------	---

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 3
Number of Online Controls 1 Number of Storage Structures 3 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	30
Ratio R	0.281		

The Alan Johnston Partnership		Page 8
1 Dale Street Liverpool L2 2ET	223-018 Rochdale SEND SW Network	
Date 09/08/2023 16:42 File SW NETWORK.MDX	Designed by JRS Checked by PB	
Micro Drainage	Network 2019.1	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: SW14, DS/PN: 1.006, Volume (m³): 4.5

Unit Reference	MD-SHE-0100-5000-1400-5000
Design Head (m)	1.400
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	100
Invert Level (m)	110.500
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.400	5.0	Kick-Flo®	0.855	4.0
Flush-Flo™	0.416	5.0	Mean Flow over Head Range	-	4.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.3	0.800	4.3	2.000	5.9	4.000	8.2	7.000	10.7
0.200	4.6	1.000	4.3	2.200	6.2	4.500	8.6	7.500	11.0
0.300	4.9	1.200	4.7	2.400	6.4	5.000	9.1	8.000	11.4
0.400	5.0	1.400	5.0	2.600	6.7	5.500	9.5	8.500	11.7
0.500	5.0	1.600	5.3	3.000	7.1	6.000	9.9	9.000	12.0
0.600	4.9	1.800	5.6	3.500	7.7	6.500	10.3	9.500	12.3

The Alan Johnston Partnership		Page 9
1 Dale Street Liverpool L2 2ET	223-018 Rochdale SEND SW Network	
Date 09/08/2023 16:42 File SW NETWORK.MDX	Designed by JRS Checked by PB	
Micro Drainage	Network 2019.1	

Storage Structures for Storm

Porous Car Park Manhole: RE01, DS/PN: 3.000

Infiltration Coefficient Base (m/hr) 0.00000	Width (m) 4.8
Membrane Percolation (mm/hr) 1000	Length (m) 36.9
Max Percolation (l/s) 49.2	Slope (1:X) 100.0
Safety Factor 2.0	Depression Storage (mm) 5
Porosity 0.30	Evaporation (mm/day) 3
Invert Level (m) 111.500	Cap Volume Depth (m) 0.300

Porous Car Park Manhole: RE02, DS/PN: 4.000

Infiltration Coefficient Base (m/hr) 0.00000	Width (m) 4.8
Membrane Percolation (mm/hr) 1000	Length (m) 28.8
Max Percolation (l/s) 38.4	Slope (1:X) 100.0
Safety Factor 2.0	Depression Storage (mm) 5
Porosity 0.30	Evaporation (mm/day) 3
Invert Level (m) 111.850	Cap Volume Depth (m) 0.300

Cellular Storage Manhole: TANK, DS/PN: 1.005

Invert Level (m) 110.580	Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000	Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000	

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	280.0	0.0	1.200	280.0	0.0	1.201	0.0	0.0

Time Area Diagram at Pipe Number 3.000 for Storm

Total Area (ha) 0.046

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From: To:		From: To:		From: To:	
0 4	0.016	4 8	0.015	8 12	0.015

Time Area Diagram at Pipe Number 4.000 for Storm

Total Area (ha) 0.061

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From: To:		From: To:		From: To:	
0 4	0.021	4 8	0.020	8 12	0.020

Time Area Diagram at Pipe Number 5.000 for Storm

Total Area (ha) 0.068

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From: To:		From: To:		From: To:	
0 4	0.023	4 8	0.023	8 12	0.022

The Alan Johnston Partnership		Page 10
1 Dale Street Liverpool L2 2ET	223-018 Rochdale SEND SW Network	
Date 09/08/2023 16:42 File SW NETWORK.MDX	Designed by JRS Checked by PB	
Micro Drainage	Network 2019.1	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 3
 Number of Online Controls 1 Number of Storage Structures 3 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 19.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.281 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

Profile(s)

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	SW01	15 Winter	2	+0%	100/15 Summer				111.708	-0.152
1.001	SW02	15 Winter	2	+0%	100/15 Summer				111.361	-0.139
2.000	SW03	15 Winter	2	+0%	30/15 Summer				111.286	-0.104
3.000	RE01	30 Winter	2	+0%	30/30 Summer				111.551	-0.099
2.001	SW04	30 Winter	2	+0%	30/15 Summer				111.198	-0.027
4.000	RE02	30 Winter	2	+0%	100/15 Summer				111.904	-0.096
4.001	SW05	15 Winter	2	+0%	30/15 Summer				111.437	-0.088
2.002	SW06	30 Winter	2	+0%	2/15 Winter				111.156	0.037
1.002	SW07	30 Summer	2	+0%	2/15 Summer				111.032	0.017
1.003	SEPARATOR	30 Summer	2	+0%	2/15 Summer				110.960	0.075
1.004	SW08	30 Summer	2	+0%	2/15 Summer				110.903	0.068
5.000	SW09	30 Winter	2	+0%	100/15 Summer				111.869	-0.086
5.001	SW10	30 Winter	2	+0%	100/15 Summer				111.476	-0.084
6.000	SW11	15 Winter	2	+0%	100/15 Summer				111.977	-0.153
5.002	SW12	15 Winter	2	+0%	100/15 Summer				111.321	-0.114
5.003	SW13	15 Winter	2	+0%	30/15 Summer				111.055	-0.100
1.005	TANK	240 Winter	2	+0%	2/120 Winter				110.833	0.028
1.006	SW14	360 Winter	2	+0%	2/15 Summer				110.861	0.211
1.007	CW01	60 Winter	2	+0%					110.055	-0.180

PN	US/MH Name	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SW01	0.000	0.22	12.6	OK	
1.001	SW02	0.000	0.30	15.0	OK	
2.000	SW03	0.000	0.21	3.8	OK	
3.000	RE01	0.000	0.25	4.4	OK	
2.001	SW04	0.000	0.63	9.9	OK	
4.000	RE02	0.000	0.28	5.9	OK	

The Alan Johnston Partnership		Page 11
1 Dale Street Liverpool L2 2ET	223-018 Rochdale SEND SW Network	
Date 09/08/2023 16:42 File SW NETWORK.MDX	Designed by JRS Checked by PB	
Micro Drainage	Network 2019.1	

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

PN	US/MH Name	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
4.001	SW05	0.000	0.34	12.0	OK	
2.002	SW06	0.000	1.10	21.8	SURCHARGED	
1.002	SW07	0.000	1.13	33.8	SURCHARGED	
1.003	SEPARATOR	0.000	1.06	33.3	SURCHARGED	
1.004	SW08	0.000	2.37	33.3	SURCHARGED	
5.000	SW09	0.000	0.38	6.6	OK	
5.001	SW10	0.000	0.40	6.6	OK	
6.000	SW11	0.000	0.22	15.1	OK	
5.002	SW12	0.000	0.49	23.6	OK	
5.003	SW13	0.000	0.59	23.6	OK	
1.005	TANK	0.000	0.25	7.8	SURCHARGED	
1.006	SW14	0.000	0.14	4.8	SURCHARGED	
1.007	CW01	0.000	0.09	4.8	OK	

The Alan Johnston Partnership		Page 12
1 Dale Street Liverpool L2 2ET	223-018 Rochdale SEND SW Network	
Date 09/08/2023 16:42 File SW NETWORK.MDX	Designed by JRS Checked by PB	
Micro Drainage	Network 2019.1	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 3
 Number of Online Controls 1 Number of Storage Structures 3 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 19.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.281 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

Profile(s)

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	SW01	15 Winter	30	+0%	100/15 Summer				111.739	-0.121
1.001	SW02	15 Winter	30	+0%	100/15 Summer				111.446	-0.054
2.000	SW03	30 Winter	30	+0%	30/15 Summer				111.652	0.262
3.000	RE01	30 Winter	30	+0%	30/30 Summer				111.674	0.024
2.001	SW04	30 Winter	30	+0%	30/15 Summer				111.636	0.411
4.000	RE02	30 Winter	30	+0%	100/15 Summer				111.928	-0.072
4.001	SW05	30 Winter	30	+0%	30/15 Summer				111.726	0.201
2.002	SW06	30 Winter	30	+0%	2/15 Winter				111.587	0.467
1.002	SW07	15 Winter	30	+0%	2/15 Summer				111.344	0.329
1.003	SEPARATOR	15 Winter	30	+0%	2/15 Summer				111.204	0.319
1.004	SW08	360 Winter	30	+0%	2/15 Summer				111.150	0.315
5.000	SW09	30 Winter	30	+0%	100/15 Summer				111.900	-0.055
5.001	SW10	30 Winter	30	+0%	100/15 Summer				111.509	-0.051
6.000	SW11	15 Winter	30	+0%	100/15 Summer				112.007	-0.123
5.002	SW12	15 Winter	30	+0%	100/15 Summer				111.406	-0.029
5.003	SW13	15 Winter	30	+0%	30/15 Summer				111.165	0.010
1.005	TANK	360 Winter	30	+0%	2/120 Winter				111.144	0.339
1.006	SW14	360 Winter	30	+0%	2/15 Summer				111.146	0.496
1.007	CW01	15 Summer	30	+0%					110.055	-0.180

PN	US/MH Name	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SW01	0.000	0.42	23.8	OK	
1.001	SW02	0.000	0.57	28.2	OK	
2.000	SW03	0.000	0.26	4.7	SURCHARGED	
3.000	RE01	0.000	0.67	11.6	SURCHARGED	
2.001	SW04	0.000	1.09	17.2	SURCHARGED	
4.000	RE02	0.000	0.54	11.1	OK	

The Alan Johnston Partnership		Page 13
1 Dale Street Liverpool L2 2ET	223-018 Rochdale SEND SW Network	
Date 09/08/2023 16:42 File SW NETWORK.MDX	Designed by JRS Checked by PB	
Micro Drainage	Network 2019.1	

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

PN	US/MH Name	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
4.001	SW05	0.000	0.59	20.4	SURCHARGED	
2.002	SW06	0.000	1.62	32.1	SURCHARGED	
1.002	SW07	0.000	1.77	53.0	SURCHARGED	
1.003	SEPARATOR	0.000	1.69	52.9	SURCHARGED	
1.004	SW08	0.000	1.19	16.7	SURCHARGED	
5.000	SW09	0.000	0.72	12.5	OK	
5.001	SW10	0.000	0.77	12.5	OK	
6.000	SW11	0.000	0.41	28.6	OK	
5.002	SW12	0.000	0.92	44.7	OK	
5.003	SW13	0.000	1.12	44.8	SURCHARGED	
1.005	TANK	0.000	0.17	5.2	SURCHARGED	
1.006	SW14	0.000	0.14	4.8	SURCHARGED	
1.007	CW01	0.000	0.09	4.8	OK	

The Alan Johnston Partnership		Page 14
1 Dale Street Liverpool L2 2ET	223-018 Rochdale SEND SW Network	
Date 09/08/2023 16:42 File SW NETWORK.MDX	Designed by JRS Checked by PB	
Micro Drainage	Network 2019.1	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 3
 Number of Online Controls 1 Number of Storage Structures 3 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 19.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.281 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

Profile(s)

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	SW01	15 Winter	100	+45%	100/15 Summer				112.260	0.400
1.001	SW02	15 Winter	100	+45%	100/15 Summer				112.120	0.620
2.000	SW03	15 Winter	100	+45%	30/15 Summer				112.149	0.759
3.000	RE01	60 Winter	100	+45%	30/30 Summer				112.034	0.384
2.001	SW04	15 Winter	100	+45%	30/15 Summer				112.085	0.860
4.000	RE02	30 Winter	100	+45%	100/15 Summer				112.236	0.236
4.001	SW05	15 Winter	100	+45%	30/15 Summer				112.163	0.638
2.002	SW06	15 Winter	100	+45%	2/15 Winter				112.026	0.907
1.002	SW07	480 Winter	100	+45%	2/15 Summer				111.926	0.911
1.003	SEPARATOR	480 Winter	100	+45%	2/15 Summer				111.924	1.039
1.004	SW08	480 Winter	100	+45%	2/15 Summer				111.922	1.087
5.000	SW09	30 Winter	100	+45%	100/15 Summer				112.554	0.599
5.001	SW10	15 Winter	100	+45%	100/15 Summer				111.980	0.420
6.000	SW11	15 Winter	100	+45%	100/15 Summer				112.207	0.077
5.002	SW12	480 Winter	100	+45%	100/15 Summer				111.923	0.488
5.003	SW13	480 Winter	100	+45%	30/15 Summer				111.918	0.764
1.005	TANK	480 Winter	100	+45%	2/120 Winter				111.916	1.111
1.006	SW14	480 Winter	100	+45%	2/15 Summer				111.906	1.256
1.007	CW01	480 Winter	100	+45%					110.056	-0.179

PN	US/MH Name	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SW01	0.000	0.69	38.6	SURCHARGED	
1.001	SW02	0.000	0.82	40.9	SURCHARGED	
2.000	SW03	0.000	0.65	11.8	SURCHARGED	
3.000	RE01	0.000	0.74	12.8	FLOOD RISK	
2.001	SW04	0.000	1.26	19.9	SURCHARGED	
4.000	RE02	0.000	0.85	17.7	SURCHARGED	

The Alan Johnston Partnership		Page 15
1 Dale Street Liverpool L2 2ET	223-018 Rochdale SEND SW Network	
Date 09/08/2023 16:42 File SW NETWORK.MDX	Designed by JRS Checked by PB	
Micro Drainage	Network 2019.1	

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

PN	US/MH Name	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
4.001	SW05	0.000	0.74	25.7	SURCHARGED	
2.002	SW06	0.000	1.80	35.5	SURCHARGED	
1.002	SW07	0.000	0.83	24.7	SURCHARGED	
1.003	SEPARATOR	0.000	0.78	24.6	SURCHARGED	
1.004	SW08	0.000	1.74	24.4	SURCHARGED	
5.000	SW09	0.000	1.33	23.0	SURCHARGED	
5.001	SW10	0.000	1.58	25.8	SURCHARGED	
6.000	SW11	0.000	0.72	49.4	SURCHARGED	
5.002	SW12	0.000	0.32	15.6	SURCHARGED	
5.003	SW13	0.000	0.38	15.0	SURCHARGED	
1.005	TANK	0.000	0.17	5.2	SURCHARGED	
1.006	SW14	0.000	0.15	5.0	SURCHARGED	
1.007	CW01	0.000	0.09	5.0	OK	