

RFL Our League Life

Drainage Strategy and Flood Risk Assessment

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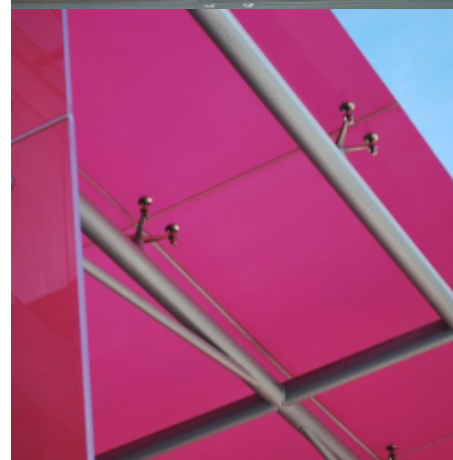
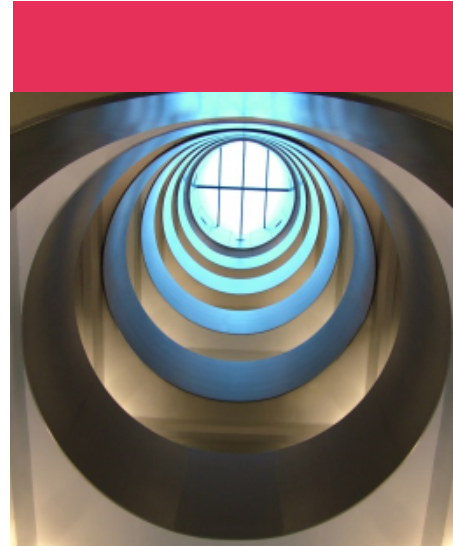
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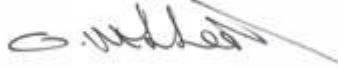
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1.0 Introduction

1.1 Project Background

Curtins have been appointed by the Rugby Football League to prepare a drainage strategy to support their planning application to construct their new Our League Life National Community Hub. The OLL Hub provides an opportunity for the RFL to utilise its strengths in northern communities and act as a vehicle for social mobility. The OLL Hub will celebrate, expand and roll out existing good practice in Rugby League communities across the north of England, adding value, and providing coordination. It provides a place for training in all aspects of the game from groundsmen, media through to sports science. It will also be used by the national teams on occasions for training purposes.

- 1.1.1 The proposals for the OLL Hub include the demolition of the existing building on-site and the erection of a training facility building and ancillary uses comprising classrooms, seminar rooms, ancillary offices, flexible conferencing space and workspace and an ancillary café / kitchen. It also includes ancillary changing facilities and a 900 seat spectator stand, together with an upgrading of the existing rugby pitch, the erection of floodlighting, and related access and highway works.
- 1.1.2 This report is based on currently available information and preliminary discussions.
- 1.1.3 Proposals contained or forming part of this report represent the design intent and maybe subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.
- 1.1.4 Where the proposed works to which this report refers are undertaken more than twelve months following the issue of this report, Curtins shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to Curtins.

1.2 Scope of Assessment

- 1.2.1 The assessment is to be undertaken in accordance with the standing advice and requirements of the Environment Agency (EA) for Flood Risk Assessments as outlined in the Communities and Local Governments Planning Policy Guidance to the National Planning Policy Framework (NPPF).
- 1.2.2 Following scrutiny of the Environment Agency flood maps it has been identified that the site lies within Flood Zone 1 and is therefore at low risk of flooding – Refer to Appendix A. The Net

Development Area is over 0.5Ha and as the site is located within a Critical Drainage Area, a Flood Risk Assessment is required to support a planning application under Core Strategy Policy EN14.

1.2.3 The assessment will:

- Investigate all potential risks of flooding to the site,
- Consider foul & surface water drainage proposals for the proposed development.

1.2.4 In April 2015, the Government made changes to the National Planning Policy Framework which made Sustainable Urban Drainage Systems (SuDS) a material consideration in the determination of planning applications for 'major' developments.

1.2.5 A Drainage Strategy will therefore be required as part of the Planning Application for the development, as the site is considered to be 'major' development by the Town and Country Planning Order 2015.

1.2.6 This Drainage Strategy reviews the following information:

- Environment Agency flood maps for rivers and sea flooding.
- UK Government Flood Warning Information Service maps for surface water flooding and reservoir flooding.
- Manchester City, Salford City and Trafford Councils Level 1 Hybrid Strategic Flood Risk Assessment (SFRA) published in March 2010.
- Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA, User Guide, Final, dated May 2010.
- Manchester City, Salford City and Trafford Councils Level 2 Hybrid Strategic Flood Risk Assessment (SFRA) published in March 2011.
- Preliminary Flood Risk Assessment (PFRA) for Manchester County Council dated May 2011.
- Manchester City Council SuDS Requirements for New Developments.
- United Utilities Public Sewer Records Extract.

1.3 Proposed Development

1.3.1 The Drainage Strategy is to support the planning application for a National Community Hub at Kylemore Way, Manchester. The site is located at grid reference SJ 87064 | 97797 | GM1.

1.3.2 The proposed development drawings are included in Appendix B.

2.0 Existing Site Details

2.1 History and Current Use

- 2.1.1 The site currently comprises an existing sports pitch and the single storey Beswick Local Shops, which have been vacant for a number of years. The site also comprises surface car parking for 28 vehicles. The site location is shown in Figure 2-1. The existing impermeable area equates to approximately 0.277 Hectares.



Figure 2-1. Site location (source: OS Open Data).

2.2 Existing Watercourses

- 2.2.1 No above ground watercourses have been identified within the proposed site or immediately adjacent to the site.
- 2.2.2 The nearest watercourse to the site is the Ashton Canal is situated approximately 800m to the North East of the site and the River Medway is located approximately 1,100m to the West of the site.

2.3 Hidden' Watercourses

- 2.3.1 A hidden (or 'lost') watercourse has been identified in the Manchester, Salford and Trafford Level 2 Hybrid SFRA, within the vicinity of the site on the opposite side of Kylemore Way (see *Figure 2-2*).



Figure 2-2: Extract from Manchester, Salford and Trafford Level 2 SFRA Surface Water Flooding Maps (approximate route of lost watercourse shown as purple dashed line).

- 2.3.2 It is difficult to locate the specific routes of lost watercourses since they are culverted underneath the urban areas around Manchester, however the lost watercourse in the vicinity of the site appears to follow the route of the Combined sewer, which may have replaced the culvert.

2.4 Existing Drainage

- 2.4.1 Infrastructure plans of the local sewer network have been obtained from United Utilities, which shows an existing combined sewer within the site, serving the existing retail units. Wayleave access would be provided along the full length of the existing sewer within the site, or alternatively agreement is reached with United Utilities that this section of sewer becomes private.
- 2.4.2 The United Utilities plans are inserted as Appendix C.

2.5 Topography

A topographical survey was undertaken and the site generally falls from the West to the East of the site from a level of 57.5m to 55.5m.

- 2.5.1 The topographical survey plan is inserted as Appendix D.

2.6 Ground Conditions

A Phase 2 Intrusive Site Investigation has been undertaken on the site. Variable depths of made ground were encountered across the site to a depth of up to 1.8m below existing ground level. Cohesive glacial till comprising firm to very stiff, slightly gravelly to gravelly clay was encountered to approximately 10m below ground level.

Bedrock geology was not encountered during the investigations.

Ground water was encountered at approximately 10m below ground level.

3.0 Development and Flood Risk

3.1 National Planning Policy Framework (NPPF) and Planning Practice Guidance

- 3.1.1 In February 2019, the Department of Communities and Local Government published the National Planning Policy Framework document (NPPF) and the Planning Practice Guidance was published in March 2014 which provides guidance on how flood risk should be assessed during the planning and development process.

Table 1: (Extract from Planning Practice Guidance) Flood Zone Classifications

These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's [Flood Map for Planning \(Rivers and Sea !\[\]\(f4349ea867b307dd2675269f68d0971f_img.jpg\)](#)), available on the Environment Agency's web site, as indicated in the table below.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Table 2: (Extract from Planning Practice Guidance) Flood Risk Vulnerability Classification

Essential Infrastructure

- Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk.
- Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood.
- Wind turbines.

Highly Vulnerable

- Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding.
- Emergency dispersal points.
- Basement dwellings.
- Caravans, mobile homes and park homes intended for permanent residential use.
- Installations requiring **hazardous substances consent**. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').

More Vulnerable

- Hospitals
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non-residential uses for health services, nurseries and educational establishments.
- Landfill* and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Less Vulnerable

- Police, ambulance and fire stations which are **not** required to be operational during flooding.
- Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'More Vulnerable' class; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill* and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.

Water-Compatible Development

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

Table 3: (Extract from Planning Practice Guidance) Flood Risk Vulnerability and Flood Zone Compatibility

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

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Notes to table 3:

- This table does not show the application of the Sequential Test which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and Exception Tests do not need to be applied to minor developments and changes of use, except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

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

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

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

3.2 Site Specific NPPF Flood Risk Categorisation

- 3.2.1 To assess the NPPF flood risk classification for the site, the first step was to inspect the UK Government web based 'Flood Map for Planning' which is used to inform planning of a site's Flood Zone(s) and the probability of flooding from rivers or seas (not taking into account the presence of flood defences or climate change). However, the web based 'Long Term Flood Risk Assessment for Locations in England' should also be used to identify the long-term flood risks from rivers and seas, surface water and reservoirs.
- 3.2.2 The Flood Map for Planning report is enclosed in *Appendix A*, and it can be seen that whole site is classified as within Flood Zone 1.
- 3.2.3 The Manchester City, Salford City and Trafford Councils Level 2 Hybrid Strategic Flood Risk Assessment identifies the wider area as a 'Critical Drainage Area' as noted in Figure 3.1 below. A flood risk assessment is required for all sites over 0.5Ha within critical Drainage areas

Figure 5-1 Manchester, Salford and Trafford CDAs overview

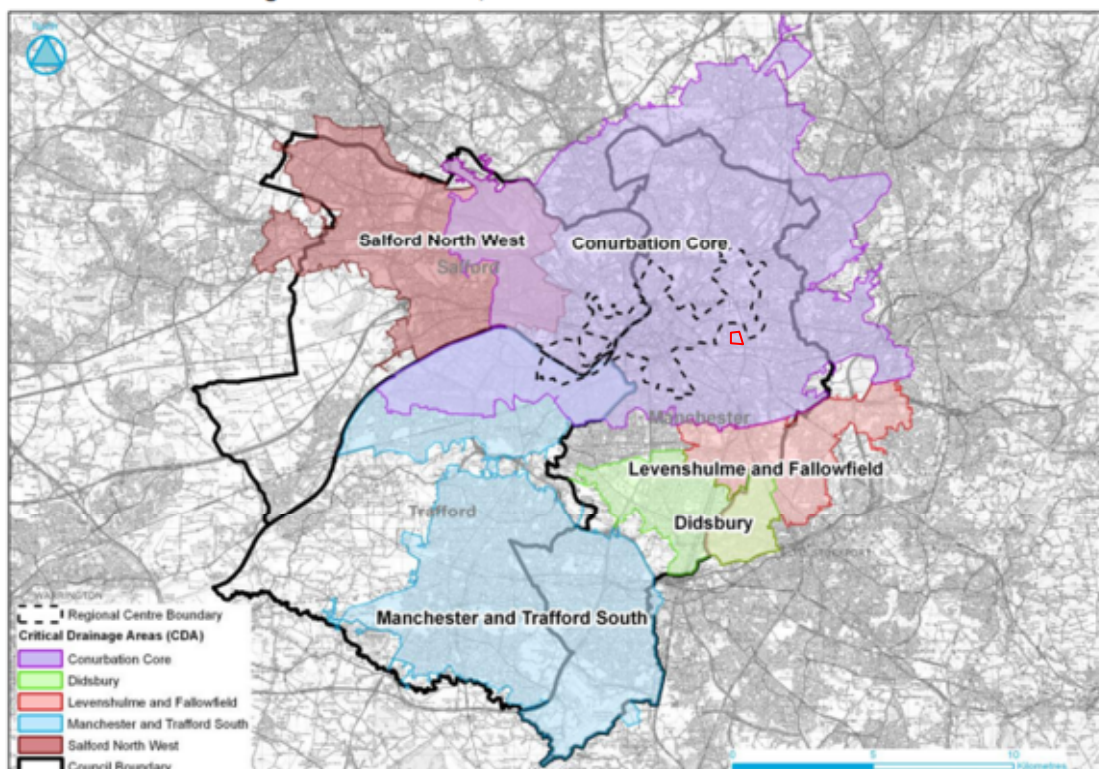


Figure 3.1 – Extract from Manchester SFRA

- 3.2.4 Further site-specific review of the flood risk to the site is provided in section 4.

3.3 Site Specific Flood Zone Compatibility

3.3.1 The proposal for the development site is likely to fall within the following category of 'Less Vulnerable' in accordance with the Flood Risk Vulnerability Classification (

3.3.2

3.3.3 Table 2).

3.3.4 The site is located within Flood Zone 1 for which a 'Less Vulnerable' development is deemed to be appropriate.

3.4 Sequential Test

3.4.1 The site is categorised as a 'Less Vulnerable' development (shown in table 2) and is within Flood Zone 1 therefore the sequential test is not required to be applied (see table 3).

4.0 Hydrological Assessment

4.1 Sources of Flood Risk

- 4.1.1 This study assesses the risk from different types of flooding to the development and the risk of flooding from the development, taking into consideration climate change, as well as how flood risks should be managed. The approach to assessing flood risk at the development site was informed by the requirements of NPPF in conjunction with the client and Environment Agency requirements.

4.2 Fluvial Flooding (Rivers and Streams)

- 4.2.1 Flooding to the site from rivers and sea is indicated below in Figure 3, taken from the UK Government's Long-Term Flood Risk Information.

Figure 3: Long Term Flood Risk Assessment Map – Flood Risk from Rivers or Sea (© Crown Copyright)



- 4.2.2 It can be seen that the entire area of the site is at a 'Very Low' risk of fluvial flooding. The site is not shown to be in an area which benefits from flood defences. The site has less than a 0.1% chance of fluvial flooding each year. Therefore, the proposed site is considered to be at a very low residual risk from fluvial flooding.

Figure 4: Long Term Flood Risk Assessment (Detailed Information) – Flood Risk from Rivers or Sea (© Crown Copyright)

Flood risk from rivers or the sea

Very low risk means that each year this area has a chance of flooding of less than 0.1%. This takes into account the effect of any flood defences in the area. These defences reduce but do not completely stop the chance of flooding as they can be overtopped, or fail.

4.3 Tidal Flooding (Coastal or Estuarine)

- 4.3.1 There is currently no flood risk identified on the Environment Agency flood maps for the site and it is therefore regarded to be at low risk from tidal flooding.

4.4 Reservoir Flooding

- 4.4.1 Reservoir flooding is extremely unlikely to happen and there has been no loss of life in the UK from reservoir flooding since 1925. The Environment Agency is the enforcement authority and ensures that reservoirs are inspected regularly, and essential safety work is carried out.
- 4.4.2 The site is located outside of the area that could be affected by reservoir flooding; therefore, the site is regarded to be at low risk from reservoir flooding.

4.5 Canal Flooding

- 4.5.1 The nearest canal to the site is the Ashton Canal which is located approximately 800m north of the site.

4.5.2 The canals are identified in the SFRA as not generally posing a direct flood risk as they are a controlled water body. Therefore, the residual risk of canal flooding is usually associated with lower probability events such as overtopping and/or the breaching of embankments.

4.5.3 Given the above information, it is considered that there is low risk of canal flooding to the site.

4.6 Groundwater Flooding

4.6.1 According to the Manchester, Salford and Trafford SFRA, there are no known reports of groundwater flooding in the Manchester, Trafford and Salford authorities.

4.6.2 The site is not shown to be within an area at risk of groundwater flooding according to the groundwater flooding map shown within the Manchester, Salford and Trafford SFRA.

4.6.3 The intrusive ground investigation works identified groundwater at a depth of 10m below ground level. At this depth the likelihood of groundwater flooding is extremely low.

4.6.4 Based on the current information it is assumed that the site is at a low risk of groundwater flooding. However, it is recommended that external ground levels across the site should fall away from the proposed buildings and ensure that the creation of low points is avoided (other than those used intentionally for drainage features) in order that in the unlikely event of groundwater flooding, the flood water is safely routed away from the buildings on site.

4.6.5 Providing the above mitigation measures were imposed, the risk from groundwater flooding would therefore be considered low post development.

4.7 Public Sewers or Highway Drainage Flooding (Infrastructure Failure)

4.7.1 There are no highway drains recorded within the site.

4.7.2 It is likely that there will be localised highway drainage surrounding the site (such as gullies and connections).

4.7.3 There is one public sewer recorded within the site which serves the building that is to be demolished as part of the project. There are public sewers in the highways surrounding the site.

4.7.4 United Utilities and Manchester City Council have not provided any records of flooding to the site or the vicinity.

4.7.5 Providing United Utilities and Manchester City Council maintain their drainage assets within and in the vicinity of the site, the risk of flooding to the proposed development site from public sewers or highway drainage is considered as low.

4.8 Surface Water Flooding to the site

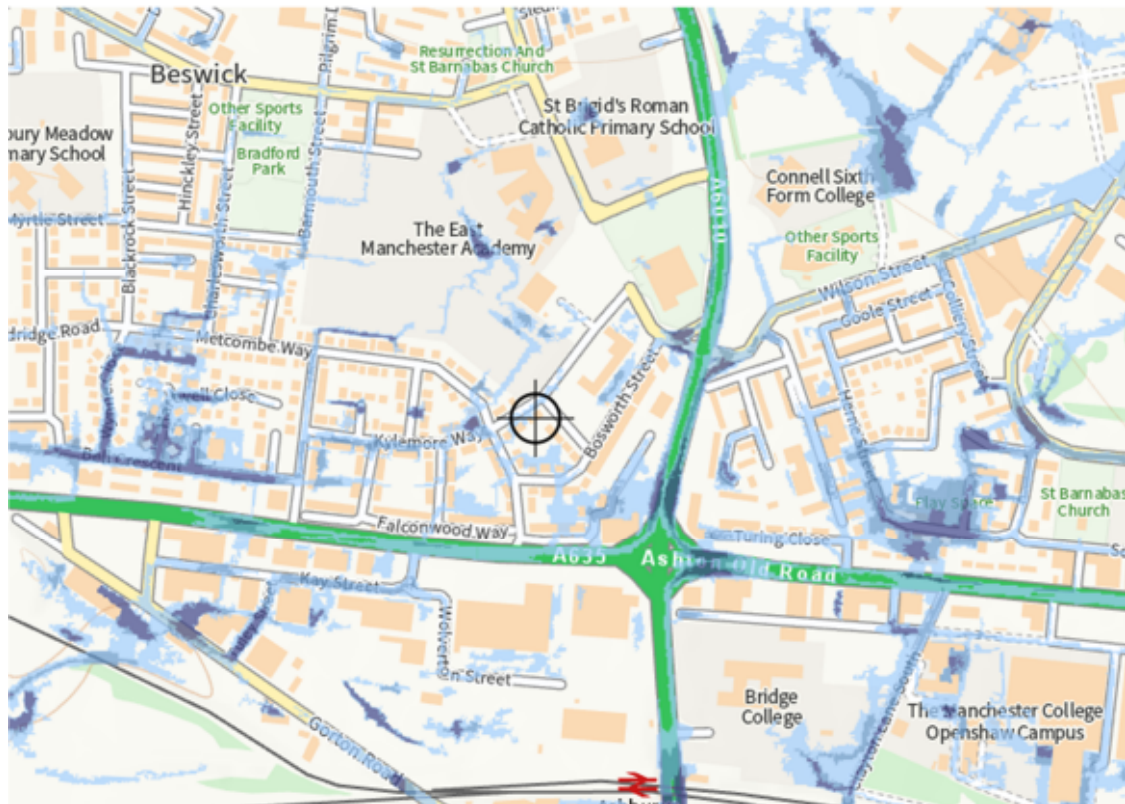
4.8.1 Surface water flooding can be caused when rainwater during extreme rainfall events does not drain away through the normal drainage system or soak into the ground with flooding occurring, principally from manholes and gullies. Surcharging sewers can result in overland flows which if originating at a higher elevation than a development site can potentially pose a flood risk.

4.8.2 From the UK Government's Flood Risk from Surface Water (extent of flooding) map;

- Where a site is located in a dark blue shaded zone, this indicates that the site is at high risk of flooding, where flooding occurs as a result of rainfall with a greater than 1 in 30 (3.3%) chance in any given year.
- Where a site is located in a mid-blue shaded zone, this indicates that the site is at medium risk of flooding, where flooding occurs as a result of rainfall of between 1 in 100 (1%) and 1 in 30 (3.3%) chance in any given year.
- Where a site is located in a light blue shaded zone, this indicates that the site is at low risk of flooding, where flooding occurs as a result of rainfall of between 1 in 1000 (0.1%) and 1 in 100 (1%) chance in any given year.
- Where a site is located in a clear (unshaded) area; this indicates that the site is at very low risk of flooding, where flooding occurs as a result of rainfall with less than 1 in 1000 (0.1%) chance in any given year.

4.8.3 The extent of flooding to the site from surface water is indicated in Figure 6 and it can be seen that the majority of the site is identified as being at a 'low or very low' risk of flooding from surface water, with the exception being a couple of areas on the existing sports pitch. The surrounding highways are generally considered at 'low or very low' risk of flooding from surface water.

Figure 6: Risk of Flooding from Surface Water - Extent of Flooding



- 4.8.4 To mitigate this risk, external ground levels across the site should fall away from the proposed buildings and ensure that the creation of low points is avoided (other than those used intentionally for drainage features) and so the flood water is safely routed away from the buildings on site.
- 4.8.5 Providing the above measures are implemented the flooding risk to the development site from surface water is therefore considered low post development.

4.9 Surface Water Flooding from the site

- 4.9.1 Developers are responsible for ensuring that new development does not increase the flood risk elsewhere. Where new development is proposed, the proposed surface water drainage network shall be designed to not flood for the critical 1 in 30-year storm event and flood water generated up to the critical 1 in 100-year plus climate change storm event shall be constrained within areas on site so as not to cause damage to buildings, essential services or adjoining developments and services.

- 4.9.2 The development has the potential to increase flood risk where additional run-off from proposed roads, paved areas and building roofs are discharged freely into the downstream drainage network. It is therefore encouraged to propose permeable areas, landscaping areas and incorporate sustainable drainage features utilising infiltration or attenuation where possible.
- 4.9.3 An assessment of the proposed surface flows is carried out within the drainage strategy within section 5 of this report.

4.10 Historical Flooding

- 4.10.1 United Utilities and Manchester City Council have not provided any records of flooding to the site or the vicinity.

5.0 Drainage Strategy

5.1 Existing Drainage

- 5.1.1 The public sewer records indicate that there is a recorded public combined sewer located within the development site boundary serving the existing building to be demolished.
- 5.1.2 The following public sewers are recorded within the vicinity of the site:
- There is a 375mm diameter combined water sewer flowing north to south along Kylemore Way (east of the site).
 - There is a 450mm diameter combined water sewer flowing north to south to the west of the site.
- 5.1.3 The existing drainage appears to be located at a suitable depth to serve the proposed development.

5.2 Proposed Foul Water Drainage

- 5.2.1 A separate foul and surface water system is proposed.
- 5.2.2 The proposed foul drainage from ground floor level and above will be collected and discharged to the surrounding public sewer network by gravity. The proposed outfall locations will be subject to confirmation of internal requirements.
- 5.2.3 Domestic flow unit rates have been used to assess the foul discharge rate from the stadium. From a review of the Architects drawings the following provision has been made

W.C's	27
WHB's	37
Showers	18
Baths	2
Sinks	7
Urinal	10
Dishwasher	2
Floor Gully	2

- 5.2.4 This equates to a peak discharge rate of 9.9l/s on match days. The majority of the time the flow rates will be negligible

- 5.2.5 United Utilities have confirmed in their pre-development enquiry response that foul water flows from the development can be accommodated within the public combined sewer within Kylemore Way. Refer to the United Utilities correspondence enclosed in *Appendix E*.
- 5.2.6 It is assumed that the site will remain under a single ownership, therefore sewers cannot be offered for adoption by United Utilities. Connection(s) to the public sewer network will be subject to a Section 106 Agreement with United Utilities
- 5.2.7 The proposed drainage strategy is enclosed in *Appendix F*.

5.3 Proposed Surface Water Drainage

- 5.3.1 Any new development site drainage should be designed in accordance with current best practice to provide adequate capacity not to flood for the critical 1 in 30-year storm event and flood water generated for up to the critical 1 in 100-year plus climate change storm event shall be constrained within the areas on site so not to cause damage to buildings, essential services or adjoining developments and services.
- 5.3.2 In February 2016, the Environment Agency released updated climate change allowances for peak rainfall intensities which should be applied to new developments. Table 4 demonstrates the climate change allowances with central and upper end allowances being considered.
- 5.3.3 Based on the nature of the development, a lifespan in excess of 60 years is anticipated. Therefore, the potential climate change allowance for 2070-2115 ranges between 20% for the central allowance and 40% for the upper end allowance. As such, an allowance of 20% for climate change on peak rainfall intensity will be included in calculations, however the 40% allowance will also be considered.

Table 4: (Extract Environment Agency Guidance) Peak Rainfall Intensity Allowance in small and urban catchments

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	10%	20%	40%
Central	5%	10%	20%

- 5.3.4 In following the standard hierarchy of drainage solutions, consideration should firstly be given to the discharge of surface water runoff by sustainable methods such as infiltration.

Infiltration

- 5.3.5 A Phase 2 Intrusive Site Investigation has been carried out at the site, and has confirmed the presence of impermeable soils below the site, infiltration is not going to be viable.

Watercourse

- 5.3.6 The nearest watercourse to the site is the Ashton Canal approximately 800m North of the site. To drain to this watercourse would not be feasible due to the distance from the site and the requirement to cross third party land.

Surface Water Sewer

- 5.3.7 The only surface water sewer in the vicinity of the site is located in Metcombe Way to the south of the site, however this connects into the combined sewer that runs down Kylemore Way, therefore discharge to a surface water sewer is unviable.

Combined Water sewer

- 5.3.8 There are various combined sewers in the vicinity of the site. The site is proposed to drain to the UU combined water network and will flow directly from the site into the public combined sewers located within the close vicinity from the development.
- 5.3.9 There are various combined water public sewers surrounding the development site and the existing drainage system on site discharges to the public sewers within Kylemore Way.
- 5.3.10 Therefore, it is proposed to discharge to the combined sewer system for surface water drainage.
- 5.3.11 Table 5 summarises the options for surface water disposal.

Table 5: Surface Water Disposal

Surface Water Disposal	Potential	Description
Infiltration	X	It is assumed that the site will not be suitable for infiltration SuDS.

Watercourse	X	The River Irwell is located 280m west of the site. A new connection to the watercourse is not considered a viable option as it would have to pass through third-party land.
Surface Water Public Sewer	X	There are no surface water public sewers in the vicinity of the site.
Combined Public Sewer	✓	There are various combined water sewers in the vicinity of the site therefore outfalls are proposed to be connected to the surrounding combined public sewer system.

5.3.12 The existing site is currently 56% impermeable, draining to the existing combined public sewer system and therefore considered brownfield.

5.3.13 The existing flow rates are estimated as:

- 1 Year = 15.6 l/s
- 30 Year = 30 l/s
- 100 Year = 36.3 l/s

5.3.14 We therefore proposed reduce flow by 50% to achieve a maximum of the following flows:

- 1 Year = 7.8 l/s
- 30 Year = 15 l/s
- 100 Year = 18.15 l/s

5.3.15 Manchester Lead Local Flood Authority (LLFA) have been consulted regarding discharge rates and a response is awaited.

5.3.16 United Utilities have been consulted and they have confirmed that the maximum permitted flow from the site is 5.0 l/s and that a variable flow is not considered appropriate. United Utilities have also confirmed in their pre-development enquiry response that flows from the development can be accommodated within the public combined sewer within Kylemore Way.

- 5.3.17 Due to the requirement for flow restriction and attenuation, the proposed surface water drainage is to be collected, with an attenuation tank located below the external landscaping
- 5.3.18 It is recommended that sustainable methods of attenuation are implemented where possible. Therefore, the introduction of landscaped areas and permeable paving are currently proposed..
- 5.3.19 The attenuation sizing currently excludes the green roof capacity and the proposed drainage system will require modelling once above ground drainage pipework has been confirmed. At this stage an assessment of volumes is based on the catchment area draining at a restricted rate of 5.0 l/s with capacity to accommodate the 1 in 100 year +40% climate change event.
- 5.3.20 Estimated volumes required are 223m³, indicated to be provided by an below ground tank.
- 5.3.21 Surface water run-off from hard paved areas at risk of contamination should receive water quality treatment.
- 5.3.22 It is assumed that the site will remain under a single ownership, therefore sewers can not be offered for adoption by United Utilities. Connection(s) to the public sewer network will be subject to a Section 106 Agreement with United Utilities.
- 5.3.23 The proposed drainage strategy is enclosed in *Appendix F*.
- 5.3.24 The final design of the drainage networks shall be in accordance with the legislation set by the Environment Agency, Manchester City Council and United Utilities.

5.4 Maintenance

- 5.4.1 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.
- 5.4.2 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. Significant sediment deposition is likely in areas used for storage, so a post clean-up operation may be required including the removal of litter, vegetation, sewerage debris and larger objects.
- 5.4.3 A management company may be required for maintenance of attenuation facilities.
- 5.4.4 For any sustainable drainage systems employed in the development, an appropriate management and maintenance plan for the sustainable drainage system for the lifetime of the development should be submitted which should include:
- Arrangements concerning appropriate funding mechanisms for its on-going maintenance of all elements of the sustainable drainage system (i.e. inspections, regular maintenance)
 - Means of access for maintenance and easements where applicable.

- Appendix A – EA Flood Map for Planning

Flood map for planning

Your reference
077652

Location (easting/northing)
387066/397781

Created
5 Nov 2021 11:43

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

This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

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.

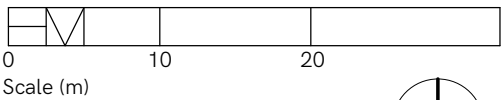
Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2021 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>

Appendix B – Proposed Site Plans



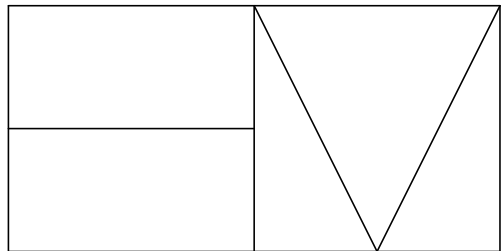
- Site Plan Key**
- | | | | |
|----|------------------------|----|------------------------|
| 01 | Proposed Hub | 07 | Existing Car Parking |
| 02 | Existing Sports Pitch | 08 | Proposed Bin Store |
| 03 | Proposed Floodlighting | 09 | Proposed ASHP Compound |
| 04 | Hard Landscaping | 10 | Proposed Cycle Store |
| 05 | Soft Landscaping | 11 | Vehicle Access |
| 06 | Drop-Off Zone | 12 | Pedestrian Access |



Notes
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DO NOT SCALE: Use figured dimensions only

- Site Boundary Key**
- | | |
|-------------------------------------|---------------------------|
| — | Application Site Boundary |
| — | Ownership Boundary |

P03	Updated following design development, public consultation and planning discussions.	RH	RH	03.11.21
P02	Stage 1 Issue	MB	RH	23.07.21
P01	First Issue	TF	RH	21.07.21
Rev	Notes	Drawn	Appr	Date



Holmes Miller
89 Minerva Street
Glasgow
G3 8LE
0141 204 2080
www.holmesmiller.com

Project 4740
OuRLeague National Hub

Drawing Name
Site Plan Proposed

Scale @ A1	Checked	Revision
1 : 500	RH	P03

Drawing Number
4740-HML-01-ZZ-DR-A-10010

Appendix C – United Utilities Drainage Layouts

Scale: 1:1250 Date: 11/08/2021	SEWER RECORDS	 Water for the North West
Address or Site Reference: ROWLANDS PHARMACY 4 WINDCROFT CLOSE, MANCHESTER, M11 3SN Printed by: Property Searches		

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

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Appendix D – Topographical Survey



General Notes

- Topographical Survey only. Utility survey results to follow.

Disclaimer

The location of underground services shown on this drawing has been determined using electro-magnetic and GPR radar techniques and visual observations. No guarantee can be given that all services have been shown on the drawing. The relevant service drawings should be obtained from the appropriate service provider company and used in conjunction with this drawing. No guarantee can be given to the accuracy and completeness of any service provider record information shown in this drawing and no liability will be accepted for any losses that arise due to a lack of accuracy in any service providers record information. Reference should also be made to historical plans and as built drawings. Excavations in the vicinity of services should be carried out with due diligence ref: HSG47 document. Location accuracy is determined by referring to manufacturers guidelines for the systems deployed. Reference should be made to the latest version of Discovery Surveys Ltd site procedures document for utility location surveys.

ABBREVIATIONS

AR	ASSUMED ROUTE	NFI	NO FURTHER INFORMATION
BD	BACKDROP	NTA	NO TRANSMITTER ACCESS
BTIC	BRITISH TELECOM CHAMBER	OSA	OUTSIDE SURVEY AREA
CI	CAST IRON	PE	POLYETHYLENE
CL	COVER LEVEL	PR	PIPE RISER
CO	CONCRETE	PVC	POLYVINYL CHLORIDE
CP	CABLE PIT	RE	RODDING EYE
CR	CABLE RISER	RWP	RAINWATER PIPE
D	DEPTH IN METRES	SV	STOP VALVE
EM	EARTH MAT	SVP	SOIL VENT PIPE
EP	ELECTRICITY POLE	TFR	TAKEN FROM RECORDS
EOT	END OF TRACE	TP	TELEGRAPH POLE
FE	FENCE EARTH POINT	UDI	UNRELIABLE DEPTH INFO
FH	FIRE HYDRANT	UTL	UNABLE TO LOCATE
G	GULLY	UTR	UNABLE TO RAISE
GPR	TRACED BY G.P.R.	UTS	UNABLE TO SURVEY
GV	GAS VALVE	UTT	UNABLE TO TRACE
GR	GAS RISER	WL	WATER LEVEL
IC	INSPECTION CHAMBER	WR	WATER RISER
IL	INVERT LEVEL	VP	VENT PIPE
LP	LAMP POST	VR	VAPOUR RECOVERY
MH	MANHOLE	WM	WATER METER
MCW	MAINS COLD WATER	WD	WASH OUT VALVE
ND	NO DEPTH (Unable to acquire depth)	WWP	WASTE WATER PIPE

LEGEND

CATV	CATV	CATV	CABLE TELEVISION
CCTV	CCTV	CCTV	CLOSED CIRCUIT TELEVISION
COM	COM	COM	COMMUNICATIONS CABLE
DA	DA	DA	DUCTING
EA	EA	EA	ELECTRIC CABLE
FA	FA	FA	FOUL WATER SEWER
GA	GA	GA	GAS PIPE
HA	HA	HA	HEATING
IA	IA	IA	INVERT LEVEL
LA	LA	LA	LAMP POST
MA	MA	MA	MANHOLE
NA	NA	NA	NO DEPTH (Unable to acquire depth)
PA	PA	PA	PIPE RISER
RA	RA	RA	RAINWATER PIPE
SA	SA	SA	STOP VALVE
TA	TA	TA	TAKEN FROM RECORDS
UA	UA	UA	UNABLE TO LOCATE
VA	VA	VA	VAPOUR RECOVERY
WA	WA	WA	WATER METER
XA	XA	XA	WASH OUT VALVE
YA	YA	YA	WASTE WATER PIPE
ZA	ZA	ZA	ZONE

No.	Revision/Issue	By	Date

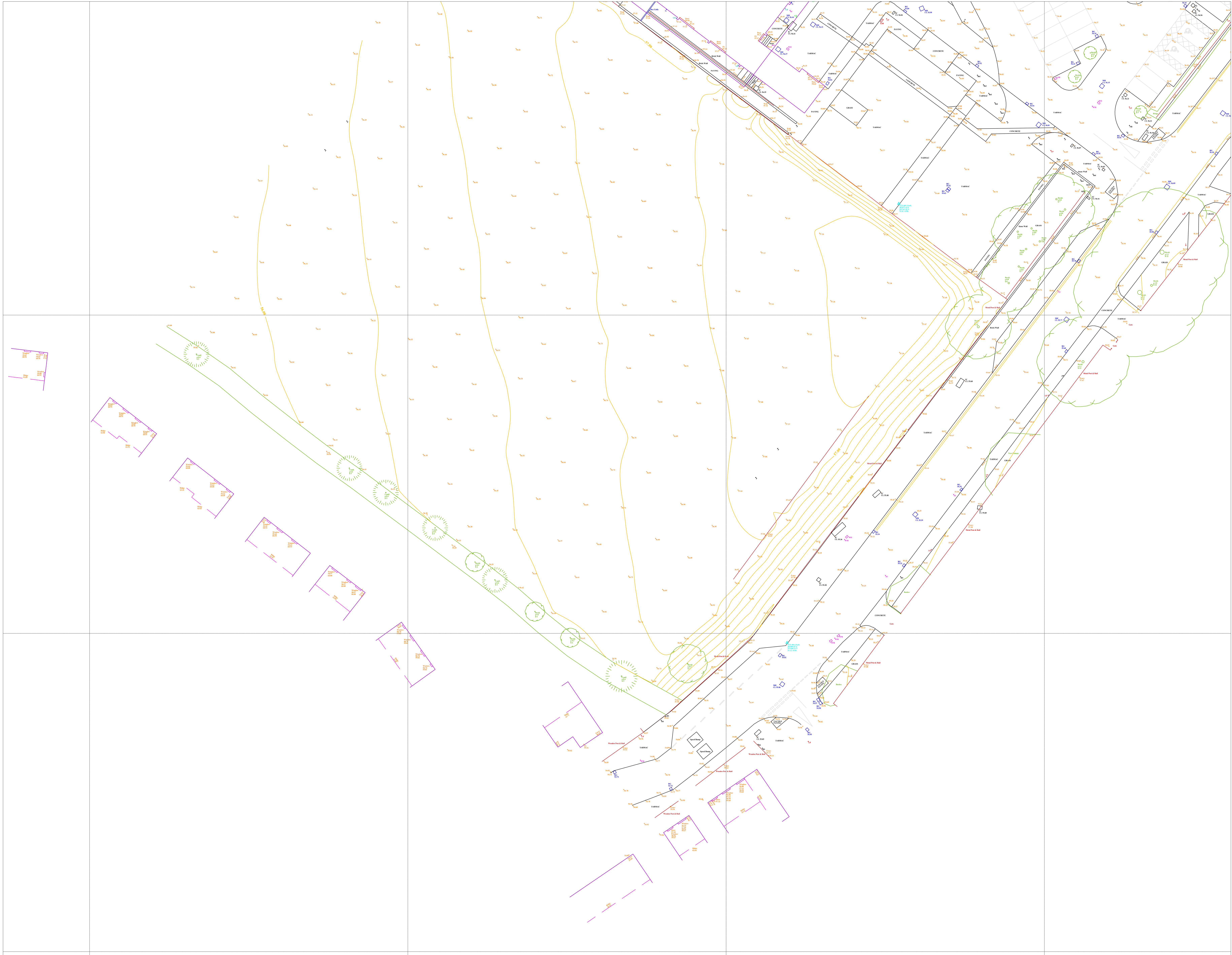


Winning Post Centre
Moorends Thorne
Doncaster
DN6 4PB

Project Name and Address

Grey Mare Lane
Kirkstead Close
Manchester
M11 3SW

Drawing No CUR 230621 050	Sheet 1 of 2
Date 01/07/21	
Scale 1:200@A0	
Client Curtins	Drawn SW
	Approved SR



General Notes

- Topographical Survey only. Utility survey results to follow.

Disclaimer

The location of underground services shown on this drawing has been determined using electro-magnetic and GPR radar techniques and visual observations. No guarantee can be given that all services have been shown on the drawing. The relevant service drawings should be obtained from the appropriate service providers company and used in conjunction with this drawing. No guarantee can be given to the accuracy and completeness of any service provider information shown in this drawing and no liability will be accepted for any losses that arise due to a lack of accuracy in any service providers record information. Reference should also be made to historical plans and as built drawings. Excavations in the vicinity of services should be carried out with due diligence ref HSG47 document. Location accuracy is determined by referring to manufacturers guidelines for the systems deployed. Reference should be made to the latest version of Discovery Surveys Ltd site procedures document for utility location surveys.

ABBREVIATIONS

AR	ASSUMED ROUTE	NFI	NO FURTHER INFORMATION
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CL	COVER LEVEL	PR	PIPE RISER
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CP	CABLE PIT	RE	RODDING EYE
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GV	GAS VALVE	UTT	UNABLE TO TRACE
GR	GAS RISER	WL	WATER LEVEL
IC	INTERSECTION CHAMBER	WR	WATER RISER
IL	INVERT LEVEL	VP	VENT PIPE
LP	LAMP POST	VR	VAPOUR RECOVERY
MH	MANHOLE	WM	WATER METER
MCW	MAINS COLD WATER	WO	WASH OUT VALVE
ND	NO DEPTH (Unable to acquire depth)	WWP	WASTE WATER PIPE

LEGEND

CATV	CATV	CATV	CABLE TELEVISION
CCTV	CCTV	CCTV	CLOSED CIRCUIT TELEVISION
COM	COM	COM	COMMUNICATIONS CABLE
DACT	DACT	DACT	DUCTING
EA	EA	EA	ELECTRIC CABLE
FWSS	FWSS	FWSS	FOUL WATER SEWER
GWSS	GWSS	GWSS	COMBINED WATER SEWER
GS	GS	GS	SURFACE WATER SEWER
GA	GA	GA	FUEL PIPE
H	H	H	GAS PIPE
IL	IL	IL	GAUGE LINE
IR	IR	IR	HEATING
IR	IR	IR	OFFSET FILL PIPE
IR	IR	IR	RADAR TRACE
IR	IR	IR	TELECOMS CABLE
IR	IR	IR	TRAFFIC LIGHT CABLE
IR	IR	IR	UNIDENTIFIED SERVICE
IR	IR	IR	VAPOUR RECOVERY
IR	IR	IR	VENT PIPE
IR	IR	IR	WATER PIPE
IR	IR	IR	SURVEY BOUNDARY
IR	IR	IR	END OF TRACE (Signal lost, unless stated otherwise)



-	-	-	-
No.	Revision/Issue	By	Date



Winning Post Centre
Moorends Thorne
Doncaster
DN6 4PB

Project Name and Address
Grey Mare Lane
Kirkstead Close
Manchester
M11 3SW

Drawing No		Sheet
CUR 230621 050		2 of 2
Date	01/07/21	
Scale	1:200@A0	
Client		
Curtins	Drawn	Approved
	SW	SR

Appendix E – Drainage Design Outputs

Calculated by:

Site name:

Site location:

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

Site Details

Latitude:

Longitude:

Reference:

Date:

Runoff estimation approach

Site characteristics

Total site area (ha):

Methodology

Q_{BAR} estimation method:

SPR estimation method:

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	900	900
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

Notes

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

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

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

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

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

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

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	3.22	3.22
1 in 1 year (l/s):	2.8	2.8
1 in 30 years (l/s):	5.47	5.47
1 in 100 years (l/s):	6.7	6.7
1 in 200 years (l/s):	7.63	7.63

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

Calculated by: Chris Gowans

Site name: Manchester Sports Hub

Site location: Bell Crescent, Manchester

This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site characteristics

Total site area (ha):1.245

Significant public open space (ha):0.748

Area positively drained (ha):0.4970000000000001

Impermeable area (ha):0.435

Percentage of drained area that is impermeable (%):88

Impervious area drained via infiltration (ha):0

Return period for infiltration system design (year):10

Impervious area drained to rainwater harvesting (ha):0

Return period for rainwater harvesting system (year):10

Compliance factor for rainwater harvesting system (%):66

Net site area for storage volume design (ha):0.5

Net impermeable area for storage volume design (ha):0.44

Pervious area contribution to runoff (%):30

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:1.4

Urban creep allowance factor:1.1

Volume control approachUse long term storage

Interception rainfall depth (mm):5

Minimum flow rate (l/s):5

Site Details

Latitude:53.47683° N

Longitude:2.19607° W

Reference:1585048722

Date:Nov 02 2021 14:49

Methodology

estiIH124

Q_{BAR} estimation method:Calculate from SPR and SAAR

SPR estimation method:Calculate from SOIL type

Soil characteristicsDefaultEdited

SOIL type:44

SPR:0.470.47

Hydrological characteristicsDefaultEdited

Rainfall 100 yrs 6 hrs:--55

Rainfall 100 yrs 12 hrs:--74.34

FEH / FSR conversion factor:1.181.18

SAAR (mm):900900

M5-60 Rainfall Depth (mm):1717

'r' Ratio M5-60/M5-2 day:0.40.4

Hydological region:1010

Growth curve factor 1 year:0.870.87

Growth curve factor 10 year:1.381.38

Growth curve factor 30 year:1.71.7

Growth curve factor 100 years:2.082.08

Q_{BAR} for total site area (l/s):8.078.07

Q_{BAR} for net site area (l/s):3.223.22

Site discharge rates	Default	Edited	Estimated storage volumes	Default	Edited
1 in 1 year (l/s):	5	5	Attenuation storage 1/100 years (m³):	191	191
1 in 30 years (l/s):	5.5	5.5	Long term storage 1/100 years (m³):	31	31
1 in 100 year (l/s):	6.7	6.7	Total storage 1/100 years (m³):	223	223

This report was produced using the storage estimation tool developed by HRWallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at <http://uksuds.com/terms-and-conditions.htm>. The outputs from this tool have been used to estimate storage volume requirements. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

The proposed development is for a new 1000 seat grandstand, with associated conference / meeting and catering facilities over two floors.

PDE calculations – 077652-CUR-00-XX-DC-C-00001-V01

Pre-development

The site is currently occupied with an existing building and sports pitch and is situated on Kirkstead Close, to the west of Bell Crescent in East Manchester. The north eastern section of the site was previously developed as a local shopping centre with associated car parking. The southern part of the site contains a grass sport pitch.

Existing Water Demand

Unknown

Existing Foul Discharge

Unknown

Existing Surface Water Runoff Rate (Proposed Development Area)

Overall Development Area – 12,451m² (1.245Ha) including 0.748Ha of Significant Green Areas, which will remain undrained. – Net Development Area – 0.497Ha
Existing Impermeable Area – 2,770m² (0.277Ha)

From HRWallingford Greenfield Runoff Rate tool – $Q_{bar} = 3.22l/s$

Post-development

The proposal is for a new 1000 seat grandstand to be constructed to the North of the existing sports pitch. Grandstand will contain hospitality / conferencing facilities.

Proposed Water Demand

Water demand is anticipated to be similar to Foul Discharge rate as calculated below.

This equates to a peak water supply rate of 9.9l/s on match days.

The majority of the time the flow rates will be negligible

Proposed Foul Discharge

Domestic flow unit rates have been used to assess the foul discharge rate from the stadium.

From a review of the Architects drawings the following provision has been made

W.C's	27
WHB's	37
Showers	18
Baths	2
Sinks	7

Urinal	10
Dishwasher	2
Floor Gully	2

This equates to a peak discharge rate of 9.9l/s on match days.

The majority of the time the flow rates will be negligible

It is assumed that the foul discharge will be to an existing combined sewer located to the north of the building and discharging into the combined sewer on Bell Crescent

A cross check has been carried out using the values in Flows and Loads for Sports Centre use.

1,000 spectators

150 staff and players

50l/person discharge rate

$1,150 \times 50 = 55,750$ litres discharge over 2 hour period

$55,750 / (120 \times 60) = 7.74$ l/s

Proposed Surface Water Runoff Rate

Please see accompanying HR Wallingford calculation sheets for estimation of attenuation requirements for the development, it is proposed to treat and attenuate the surface water runoff from the site, prior to discharge into the existing combined sewer in Bell Crescent..

Based on a site area for the new development of 0.435 ha and a greenfield runoff rate

QBAR = 3.22 l/s.

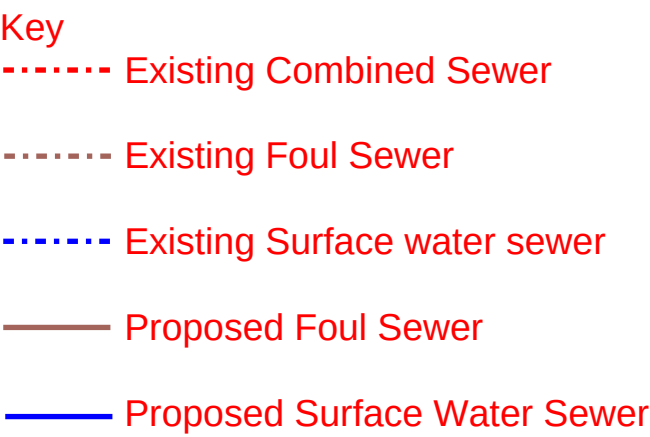
Proposed discharge rate from new development area will be set to match this greenfield runoff rate and will this be 3.22/s (post-development). Attenuation of 316m³ will be provided on site in a mixture of oversized pipes and storage crates.

It is proposed to limit the surface water discharge rates for rainfall events above the 1:30 year + climate change event to 3.22/s to match the greenfield runoff rate. All necessary attenuation will be provided on site, prior to the outfall.

Surface Water Policy

Refer to attached Surface Water Disposal Options Report, which should be read in conjunction with this application.

Appendix F – Proposed Drainage Layout

[illegible]

Our Locations

Birmingham

2 The Wharf
Bridge Street
Birmingham
B1 2JS
T. 0121 643 4694
birmingham@curtins.com

Bristol

Quayside
40-58 Hotwell Road
Bristol
BS8 4UQ
T. 0117 302 7560
bristol@curtins.com

Cardiff

3 Cwrt-y-Parc
Earlswood Road
Cardiff
CF14 5GH
T. 029 2068 0900
cardiff@curtins.com

Douglas

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29-31 Duke Street
Douglas
Isle of Man IM1 2AZ
T. 01624 624 585
douglas@curtins.com

Edinburgh

1a Belford Road
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EH4 3BL
T. 0131 225 2175
edinburgh@curtins.com

Kendal

28 Lowther Street
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Cumbria LA9 4DH
T. 01539 724 823
kendal@curtins.com

Leeds

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78-80 East Street
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T. 0113 274 8509
leeds@curtins.com

Liverpool

Curtin House
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Riverside Drive
Liverpool L3 4DB
T. 0151 726 2000
liverpool@curtins.com

London

Units 5/6
40 Compton Street
London
EC1V 0BD
T. 020 7324 2240
london@curtins.com

Manchester

Merchant Exchange
17-19 Whitworth Street West
Manchester
M1 5WG
T. 0161 236 2394
manchester@curtins.com

Nottingham

56 The Ropewalk
Nottingham
NG1 5DW
T. 0115 941 5551
nottingham@curtins.com