



Olive Primary School, Cheetham Hill.

Flood Risk Assessment and Drainage Strategy Report

Prepared for Conlon Construction Ltd.

05/01/2023

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Carl Dawson
Senior Civil Engineer
Carl.Dawson@clancy.co.uk
Tel: 0161 613 6000

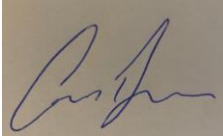
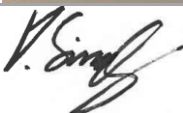
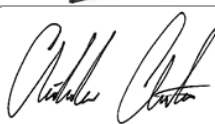
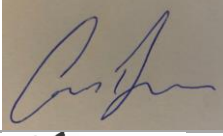
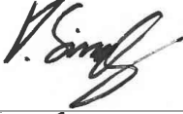
enquiries@clancy.co.uk

Clancy Consulting Limited
Dunham Court
2 Dunham Road
Altrincham
Cheshire
WA14 4NX

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1.0 INTRODUCTION

1.1 Project Background

- 1.1.1 Clancy Consulting Ltd has been appointed by Conlon Construction Ltd to provide a Flood Risk Assessment (FRA) and Drainage Strategy (DS) for the proposed development at Olive Primary School, Cheetham Hill.
- 1.1.2 The proposed development encompasses a full planning application for a new school, comprising of a 2-storey block, car park, play areas and MUGA pitch.
- 1.1.3 The report provides information on the nature of flood risk at the site and follows Government guidance regarding development and flood risk.
- 1.1.4 The report is based on current available information and preliminary discussions.
- 1.1.5 Proposals contained or forming part of this report represent the design intent and may be 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 or commencing such works.
- 1.1.6 Where the proposed works to which this report refers are undertaken more than twelve months following the issue of this report, Clancy Consulting Ltd shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to Clancy Consulting Ltd.
- 1.1.7 This report is prepared solely for the benefit of the Client. This report may not be assigned without prior written permission from Clancy Consulting Ltd.

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 the Flood Risk Assessment as outlined in the communities and local Government Planning Policy Guidance to the National Planning Policy Framework (NPPF).
- 1.2.2 The assessment will:
 - Investigate all potential risks of flooding to the site,
 - Consider the impact the development may have elsewhere with regards to flooding,
 - Consider design proposals to mitigate any potential risk of flooding determined to be present, and
 - Consider foul and surface water drainage proposals for the proposed development.
- 1.2.3 The total site area is approximately 1.285ha and following scrutiny of the EA flood maps it has been identified that the site lies within Flood Zone 1. See figure 1 below.

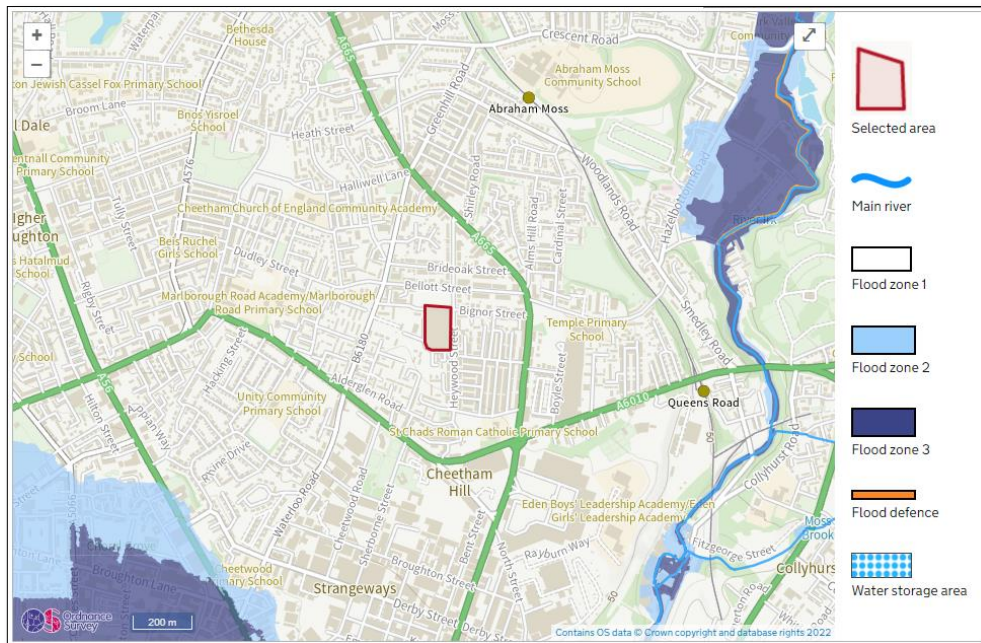


Figure 1 – EA Flood map for planning

1.2.4 The site lies within the Critical Drainage Area (CDA). See below figure 2, extract from Manchester, Salford and Trafford Strategic Flood Risk Assessment (SFRA) identifying the proposed development area as being in the Conurbation Core CDA, with the red dot highlighting the approximate site location.

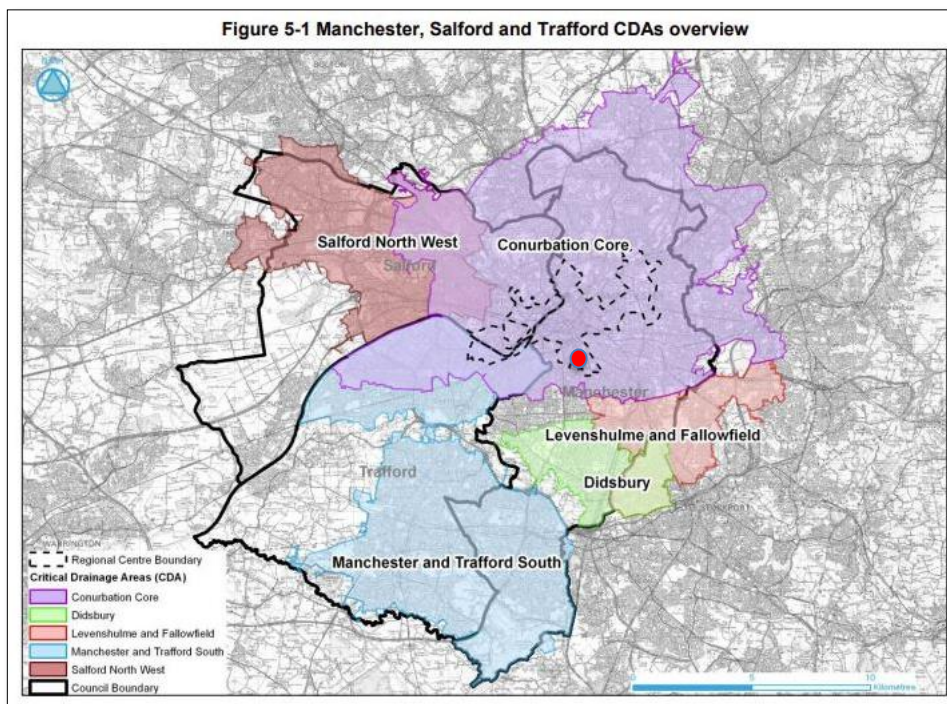


Figure 2 – Manchester, Salford and Trafford CDAs overview.

- 1.2.5 As the site is greater than 1 ha and is located in a Conurbation Core CDA, a Flood Risk Assessment of the site is required.
- 1.2.6 In April 2015, the Government made changes to the NPPF which made Sustainable Urban Drainage Systems (SuDS) a material consideration in the determination of planning applications for 'Major' developments.
- 1.2.7 A Drainage Strategy will therefore be required as part of the Planning Application for the development, as the site is considered to be a 'major' development by the Town and County Planning Order 2015.
- 1.2.8 The Flood Risk Assessment and Drainage Strategy reviews the following information:
- *Flood maps from the Environment Agency published online.*
 - *UK Government Flood Warning Information Service maps for surface water flooding and reservoir flooding.*
 - *Strategic Flood Risk Assessment (SFRA) for Manchester, Salford and Trafford.*
 - *Environment Agency ground water vulnerability maps*
 - *United Utilities Sewer Mapping records.*
 - *Topographical Survey – Greenhatch Group – 38686_T Rev 0 – 04.12.20.*
 - *CCTV Survey information – Underground Surveys Ltd – Dated 14/12/2020*

1.3 Proposed Development

- 1.3.1 The proposed development encompasses a full planning application for a new school, comprising of a 2-storey teaching block, car park and access off Heywood Street, play areas surrounding the building and MUGA pitch to the west of the site. The total site area is 1.28ha, c.0.6ha to be developed as mentioned above, with the remaining area undeveloped for recreational use.
- 1.3.2 The ground floor of the proposed teaching block, will comprise of office space, reception, infant rooms, toilet facilities, kitchen and assembly hall. The plant room will also be located at this level to the northern part of the building, with access directly onto the car park.
- 1.3.3 The first floor of the proposed teaching block, will comprise mainly of junior teaching rooms, with staff room, storeroom and toilet facilities also on this level.
- 1.3.4 To the northwest part of the site, north of the access road, an electric substation and with Battery storage area are currently proposed. The bin store is proposed to the western part of the car park.
- 1.3.5 The proposed car park is located to the north of the site, currently noted as Brentfield Avenue. This road appears to be unadopted and lies within the site boundary with restricted access to both ends.
- 1.3.6 It is anticipated that the proposed development will be constructed in a single phase and construction will commence in 2023 and fully operational end of 2023.
- 1.3.7 Refer to Appendix A for the development proposals.
- 1.3.8 See figure 3 below showing an extract of the proposed development.

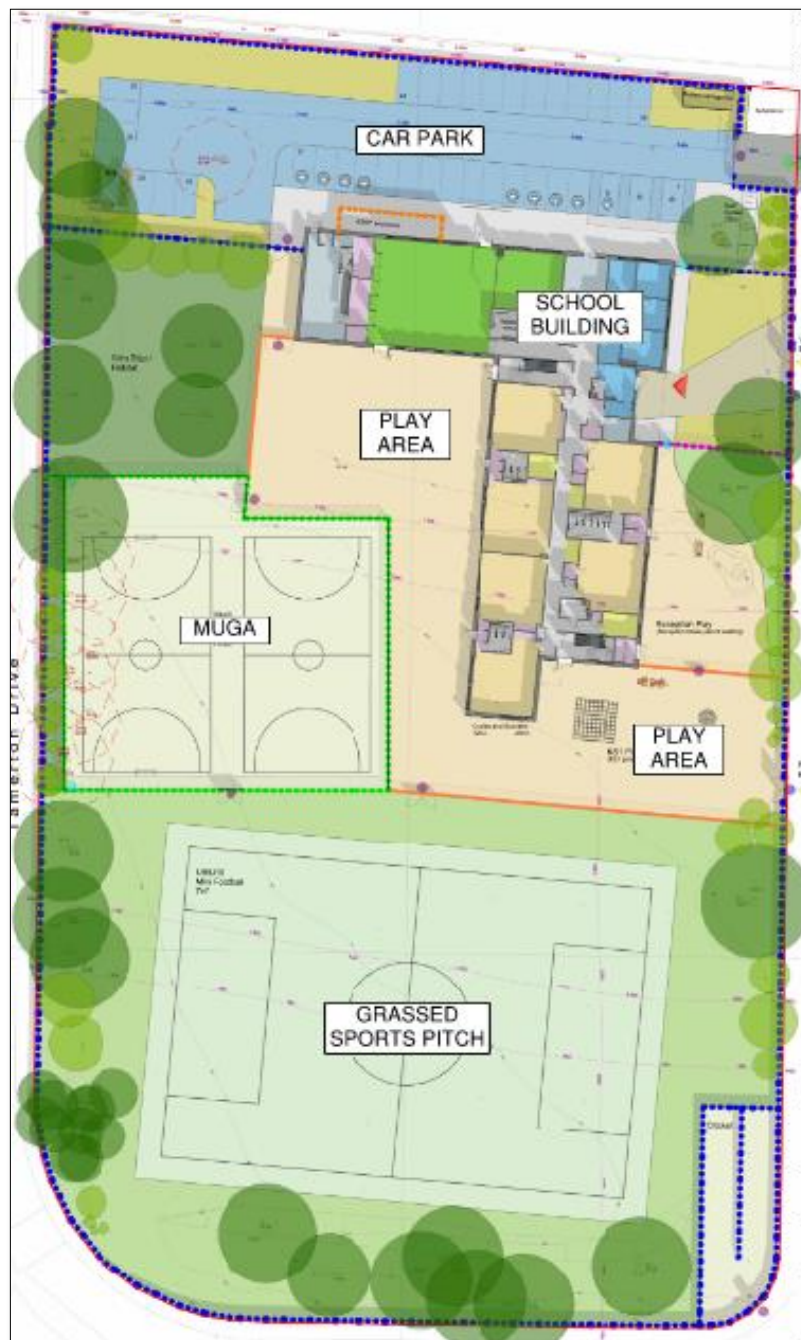


Figure 3 – Site Layout.

2.0 EXISTING SITE DETAILS

2.1 History and Current Use

- 2.1.1 The site is located in the Cheetham Hill area of Greater Manchester. It is approximately 2.5km north of Manchester City Centre. The approximate National Grid Reference of the centre of the site is E384150, N400796.
- 2.1.2 Cheetham Hill Road is approximately 270m east of the site. Heywood Street is located directly to the east of the site. Tamerton Drive bounds the south and west of the site with Brentfield Avenue to the north within the site, assumed to be an unadopted road. See figure 4 below for site location (marked with a red dot).



Figure 4 – Site Location Plan.

- 2.1.3 The existing site is known as Bignor Street Park. Brentfield Avenue lies to the north within the site, assumed to be an unadopted road with basketball and cricket courts also to the north of the site. To the middle and southern portion of the site, the existing field seems to be used as a cricket pitch with an artificial grass strip to the centre of the field. To the north, west and southern part of the site, trees line the boundary and to the east, single trees are spotted adjacent to Heywood Street.
- 2.1.4 The site is located within a residential area surrounded by mixed housing types, WMB Hillcity Day Nursery (to the west), New Testament Church of God (to the south) and further recreational areas to the north.
- 2.1.5 The site area is 1.28ha made up of c.80% soft scape and c.20% hardstanding, therefore we have classified this as a greenfield site. The existing hard standing to the north is a private road and sports court area (0.26ha), where gullies are expected to collect and convey surface water flows to the public combined sewer.

2.2 Topography

- 2.2.1 The topographical survey suggests the site falls in a south westerly direction. The highest level of the site set at 64.36m AOD to the northeast corner, adjacent to Heywood Street and the lowest level of the site is set at 61.28m AOD to the southwest corner adjacent to Tamerton Drive.
- 2.2.2 The site falls c.3m in a southwest direction and typically 1.5m in a westerly direction.
- 2.2.3 To the south of the site, a c.0.5m mound separates the playing field and Tamerton Drive at the tree line.
- 2.2.4 The site is bounded by a c.2m blue metal fence. Refer to Appendix B for Topographical Survey.

2.3 Existing Drainage

- 2.3.1 The United Utilities (UU) public sewer records and CCTV survey information can be found in Appendix C.
- 2.3.2 To the north and within the site (Brentfield Avenue), there is a 360x400 brick combined sewer changing to a 375mm VC combined sewer. Records suggest this sewer falls in a westerly direction at c.3.5m deep.
- 2.3.3 To the east of the site (Heywood Street), there is a 450mm VC combined sewer. Records suggest this sewer falls in a north south direction at c.4.4m deep.
- 2.3.4 To the south of the site (Tamerton Drive), there is a 225mm VC combined sewer. Records suggest this sewer falls in an east west direction at c.2.5m deep.
- 2.3.5 To the west of the site (Tamerton Drive), there is a 300mm VC combined sewer. Records suggest this sewer falls in a southern direction at c.2.6m deep. Both the 225mm and 300mm sewers in Tamerton Drive meet at the access to WMB Hillcity Day Nursery and head in a westerly direction towards Waterloo Road.

2.3.6 There are currently no foul water discharge from the existing site.

2.3.7 Apart from the small area of hard standing (Brentfield Avenue), there is no other areas that are positively drained from the site.

2.4 Existing Watercourses and Other Waterbodies

2.4.1 No above ground watercourses have been identified within the proposed site or immediately adjacent to the site.

2.4.2 The closest watercourse to the site is the River Irk located c.1km to the east and southeast of the site. The River Irwell is located c.2km directly west and c.1.5km to the southwest of the development site. Both are classified as main river at this location.

2.5 Geology

2.5.1 At the time of writing this report the full Phase 2 Site Investigation report is not available however an initial assessment of ground conditions has been assessed, based on available data. The Phase 2 site investigation for the proposed development are scheduled to be carried out in mid January 2023.

2.5.2 The currently available ground investigation data indicates Made Ground in all exploratory locations to depths ranging from 0.60m in the northeast of the site to 3.55m in the north - north central portion of the site. In general, the Made Ground has been found to be underlain by sandy gravelly clay interbedded with sand deposits to a maximum proven depth of 20m below ground level. It should be noted that the existing ground investigation is limited to specific site areas.

2.5.3 The available ground monitoring data for the site encountered ground water at depths ranging from 0.6m to 3.8m.

2.5.4 According to magic.defra.gov.uk mapping system, Geology and Soils - Ground water vulnerability map suggests the site is a medium to low risk area.

2.5.5 According to magic.defra.gov.uk mapping system, Geology and Soils – Aquifer Designation Map under the Bedrock section, shows that underlying the site a Principle/Secondary B Aquifer is present and under Superficial Drift section, the area shows a Secondary A or B Aquifer.

2.5.6 The site is not located with a Groundwater Source Protection Zone.

3.0 DEVELOPMENT AND FLOOD RISK

3.1 NPPF and PPG

- 3.1.1 The Department of Communities and Local Government published the National Planning Policy Framework document (NPPF – published on 27th March 2012 with recent revision date 25th August.2022) and the Planning Practice Guidance (PPG – published 6th March 2014) which provided guidance on how flood risk should be assessed during the planning and development process.
- 3.1.2 See below Table 1 extract from PPG 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 Maps for Planning, available online.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 0.1% annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map for Planning – all land outside Zones 2, 3a and 3b)
Zone 2 Medium Probability	Land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1% or greater annual probability of river flooding; or Land having a 0.5% or greater annual probability of sea. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: • land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or • land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Table 1 – Flood Zone classification.

3.1.3 See below Table 2 extract from PPG - Flood Risk Vulnerability Classification.

Annex 3: Flood risk vulnerability classification

Information on 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 infrastructure for electricity supply including generation, storage and distribution systems; including electricity generating power stations, grid and primary substations storage; and water treatment works that need to remain operational in times of flood.
- Wind turbines.
- Solar farms.

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.
- Car parks.

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 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 2 - Flood Risk Vulnerability Classification.

3.1.4 See below Table 3 extract from PPG - 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 †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	✓ *

Key:

✓ Exception test is not required

X Development should not be permitted

Notes to table 2:

- This table does not show the application of the [Sequential Test](#) which should be applied first to guide development to the lowest flood risk areas; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and [Exception Tests](#) do not need to be applied to those developments set out in [National Planning Policy Framework footnote 56](#). The Sequential and Exception Tests should be applied to 'major' and 'non major' development;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

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

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

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

Paragraph: 079 Reference ID: 7-079-20220825

Revision date: 25 08 2022

Table 3 - Flood Risk Vulnerability and Flood Zone Compatibility.

3.2 Flood Risk Category

- 3.2.1 To assess the flood risk classification for the site, UK Government online 'Flood Maps for Planning' has been reviewed. This is used to inform planning of the sites Flood Zone and the probability of flooding from Rivers and Seas. This doesn't consider the presence of flood defences or climate change.
- 3.2.2 UK Government online 'Long Term Flood Risk Assessment for Locations in England' should also be assessed to identify the long-term flood risks from rivers and seas, surface water and reservoirs.
- 3.2.3 The flood Map for Planning report is included in Appendix E and it can be noted that the proposed development site is classified as within Flood Zone 1.
- 3.2.4 Refer to Section 4 of this report for site specific Flood Risk assessment.

3.3 Flood Zone Compatibility

- 3.3.1 The proposed development site is likely to fall in the category shown in Table 2 above as;
- Non-residential uses for health services, nurseries and **educational establishments**.
- 3.3.2 Educational establishments are classed as '**More Vulnerable**' development in the above Table 2 - Flood Risk Vulnerability Classification.
- 3.3.3 The site has been identified as located in Flood Zone 1, for which a 'More Vulnerable' development is deemed to be appropriate.

3.4 Sequential Test

- 3.4.1 Sequential test is not necessary for this site due to the site being categorised as a 'More Vulnerable' development and lies within Flood Zone 1. See Table 3 above.

4 HYDROLOGICAL ASSESSMENTS

4.1 Sources of Flood Risk

4.1.1 This section assesses the risk of flooding from different sources of flooding to and from the development, taking into consideration climate change as well as how flood risk should be managed.

4.1.2 The sources of flooding to be assessed are;

- Flooding from Rivers and Seas (Fluvial, Coastal or Estuarine).
- Reservoir Flooding.
- Flooding from Groundwater.
- Flooding from Public Sewers or Highway Drains.
- Canal Flooding.
- Surface Water flooding to the site.
- Surface Water flooding from the site.

4.2 Flooding from Rivers and Seas (Fluvial)

4.2.1 The map shown below in figure 5 shows that the site is located within Flood Zone 1 and therefore the land is assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%). See Appendix E.

4.2.2 The site is not considered at risk of fluvial flooding.

4.2.3 The site is not shown to be in an area which benefits from flood defences.

4.2.4 There is currently no flood risk identified on the EA flood maps for the site and it is therefore not considered at risk from tidal flooding (Coastal or Estuarine).

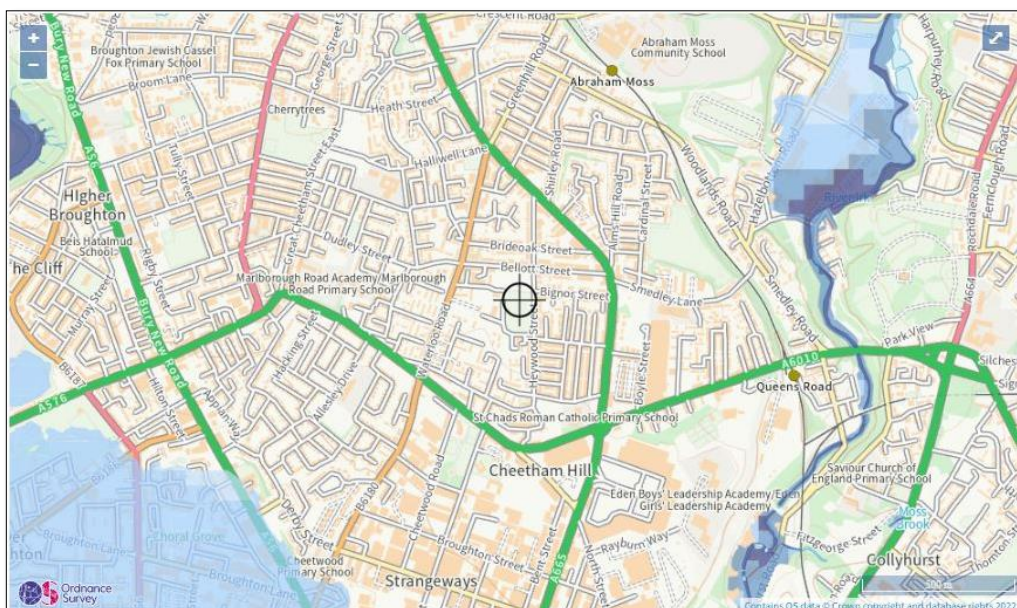


Figure 5 – Environment Agency (EA) Flood Zone Map – Flooding from rivers and sea.

4.3 Reservoirs Flooding

- 4.3.1 The Long-Term Flood Risk Assessment (from Reservoirs) map shows the site not to be flooded if a reservoir were to fail and release the water it holds. See figure 6 below.
- 4.3.2 The site is located outside of the extent of a reservoir flood risk according to Flood Maps.
- 4.3.3 The government state that if a reservoir flood event were to occur, even in the worst-case scenario many areas shown as possibly being at risk of flooding would be expected to receive no more than a few centimetres of flood water.
- 4.3.4 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.

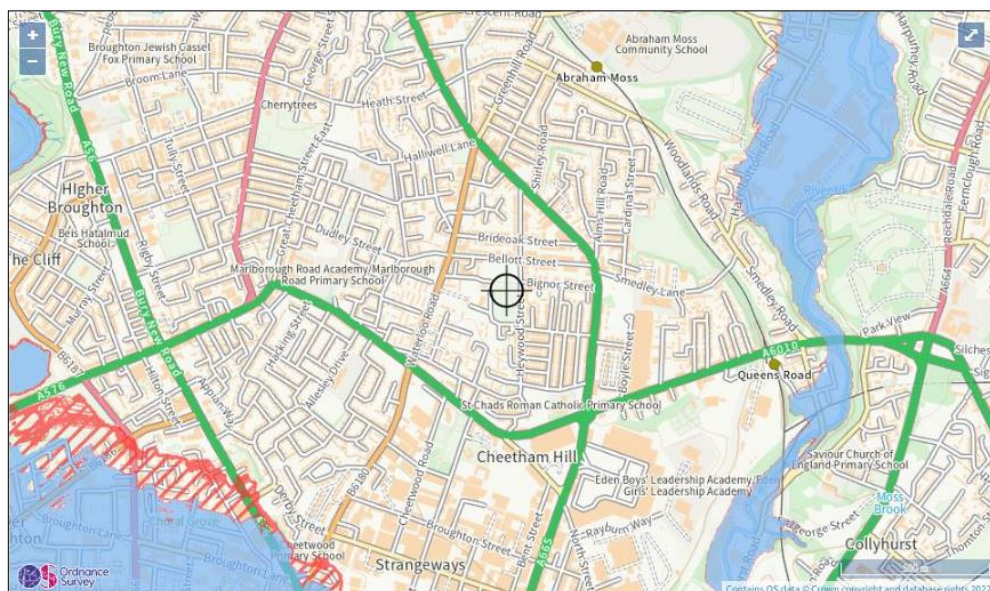


Figure 6 – Reservoir flood map.

4.4 Flooding from Groundwater

- 4.4.1 According to the Groundwater flood map shown on the Strategic Flood Risk Assessment (SFRA) maps for Manchester, Salford and Trafford, there are no known reports of groundwater flooding in area of the site.
- 4.4.2 Site Investigation have not yet been undertaken therefore ground water levels are unknown.
- 4.4.3 Historic borehole logs taken from BGS online data have been reviewed in the vicinity of the site. Borehole log 9 recorded a water strike at 16 feet below ground level. Borehole log 14 did not strike water during a 20-foot hole. Therefore, based on the above information, it is overall assumed that the site is at low risk of groundwater flooding however should be reviewed following intrusive site investigation works and ground water monitoring.

- 4.4.4 Refer to Appendix F for Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA Ground Water flooding map confirming the site to be in area of no risk to flooding from groundwater.

4.5 Public Sewers or Highway Drainage Flooding

- 4.5.1 There are public sewers located in close proximity and within the site as detailed in Section 2.3.
- 4.5.2 A predevelopment enquiry has been submitted to United Utilities to which we have not made us aware of any existing flooding issues or been advised of any sewer surcharge records to the combined water sewers.
- 4.5.3 Providing United Utilities and Manchester City Council maintain their drainage assets within the vicinity of the site, the risk of flooding to the proposed development site is considered as low.

4.6 Canal Flooding

- 4.6.1 There are no canals within the vicinity of the site. The closest canal is the Rochdale Canal located c.2.2km to the southeast.
- 4.6.2 The canals identified in the SFRA are not generally posing a direct flood risk as they are a controlled water body. Therefore, the residual risk of canal flooding is usual associated with lower probability event such as overtopping and/or the breaching or embankments.
- 4.6.3 Given the above information, canals are not considered as a risk canal flooding to the site.

4.7 Surface Water Flooding to the site

- 4.7.1 Surface water flooding to the site can be caused when rainwater during extreme rainfall events does not drain away through the normal drainage system or soakaway into the ground. Surcharging or blocked sewers can result in overland flows which can potentially pose a risk of flooding should the source of this flooding be at a higher elevation than the development.
- 4.7.2 From the UK Governments Flood Risk from surface water map;
- 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 a 1 in 1000 (0.1%) chance in any one year.
 - Where the site is located in a light blue shaded area, this indicates that the site is at **low risk** of flooding, where flooding occurs as a result of rainfall between 1 in 1000 (0.1%) and 1 in 100 (1%) chance in any one year.
 - Where the site is located in a blue shaded area, this indicates that the site is at **medium risk** of flooding, where flooding occurs as a result of rainfall between 1 in 100 (1%) and 1 in 30 (3.3%) chance in any one year.
 - Where the site is located in a dark blue shaded area, 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 one year.

- 4.7.3 The extent of flooding to the site from surface water is indicated in figure 7 below. This indicates that the site is identified as being 'very low' risk of flooding from surface water.

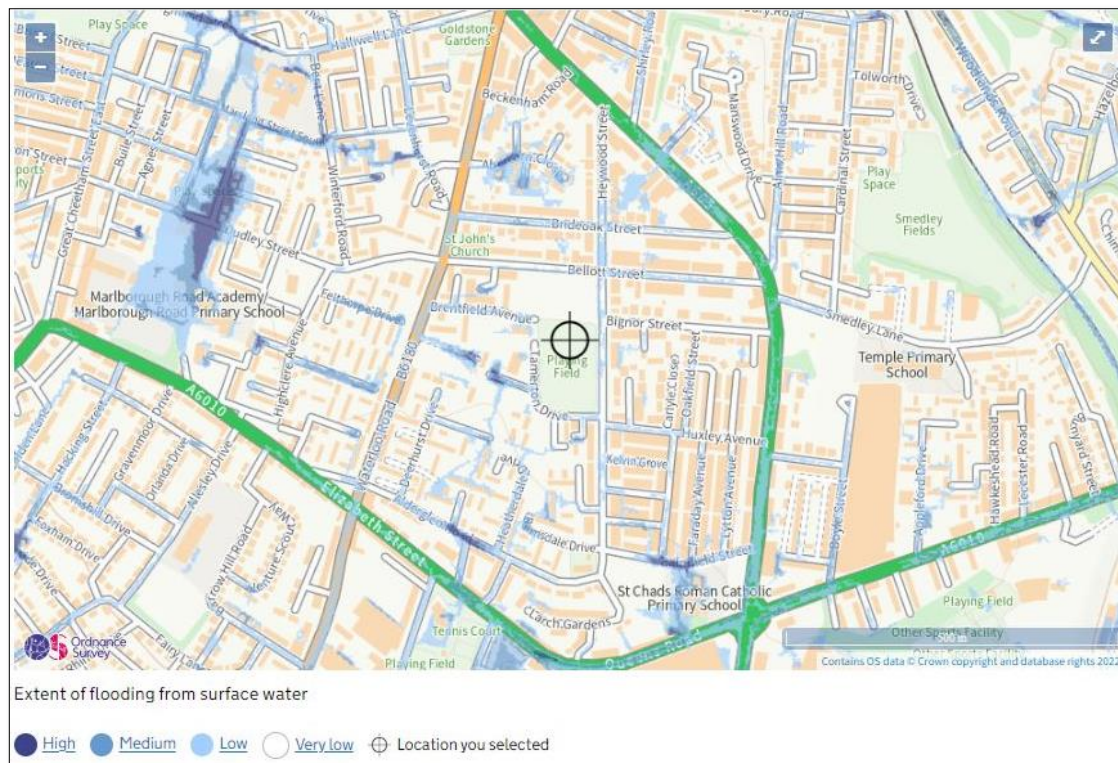


Figure 7 – Surface Water flood map.

4.8 Surface Water Flooding from the site

- 4.8.1 Developers are responsible for ensuring that new developments do not increase the flood risk elsewhere. Where new developments are proposed, the proposed surface water drainage network shall be designed to not flood in a 30 year storm event and flood water generated up to the critical 1 in 100 year plus climate change storm event shall be controlled and constrained within areas on site so as not to cause damage to buildings, essential services or adjoining developments and services.
- 4.8.2 The development has the potential to increase flood risk where additional run-off from proposed hardstanding areas is discharged freely into the downstream drainage network.
- 4.8.3 It is encouraged to propose sustainable drainage methods where possible.
- 4.8.4 Section 6 of this report describes in detail the proposed Drainage Strategy for the site and how surface water run-off/flows will be managed.

4.9 Historical Flooding

- 4.9.1 At the time of writing this report, no information has been obtained or provided, showing records of flooding to the site or in the vicinity of the site.

- 4.9.2 It is recommended that United Utilities and Manchester City Council are contacted to request any records of historical flooding to the site.

5 FLOOD RISK MITIGATION

5.1 Sources of Flood Risk

- 5.1.1 This section advises on flood risk mitigation measures from the different types of flooding that could potentially increase risk of flooding to the site, albeit considers as low-very low risk of flooding as described in Section 4.

- Flooding from Rivers and Seas (Fluvial, Coastal or Estuarine).
- Flooding from Groundwater.
- Surface Water flooding to the site.
- Surface Water flooding from the site.

- 5.1.2 This section will not consider mitigation measures for the following types of flooding due to the improbable risk of flooding to the site.

- Reservoir Flooding – not consider due to very low risk.
- Flooding from Public Sewers or Highway Drains.
- Canal Flooding.

5.2 Flooding from Rivers and Seas (Fluvial, Coastal or Estuarine) Mitigation

- 5.2.1 The site is shown to be located within the Flood Zone 1 extent. This means the site is considered to be at less than 0.1% risk of flooding from rivers and seas.
- 5.2.2 The lowest level of the site is recorded as 61.28m AOD. It is recommended that the proposed finished floor levels are designed above this level to remain classified as Flood Zone 1.
- 5.2.3 As a precaution, 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 to direct water safely away from the buildings on site.
- 5.2.4 Providing the above mitigation measures were imposed, the risk from flooding would be considered to be low, post development.

5.3 Flooding from Groundwater Mitigation

- 5.3.1 Groundwater flooding tends to be more persistent than other sources of flooding, typically lasting for weeks or months rather than hours or days. Groundwater flooding does not generally pose a significant risk to life, due to the slow rate at which the water level rises, however it can cause significant risk to property.
- 5.3.2 Generally, floor levels will be at or above ground levels and there are no basements proposed. Therefore, the risk of ground water flooding to the area is considered low.

- 5.3.3 During intrusive site Investigation works ground water levels should be monitored and advised.
- 5.3.4 External ground levels across the site should fall away from 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.
- 5.3.5 Providing the above mitigation measures were imposed, the risk from groundwater flooding would be considered to be low, post development.

5.4 Surface Water Flooding to the site Mitigation

- 5.4.1 The UK Government Long Term Flood Risk Assessment surface water flood maps indicate that the site is at very low to low risk of surface water flooding. However, the proposed building is assumed to be constructed at the same or above existing levels, which is above the current extent of flooding.
- 5.4.2 Measures outlined in this section are recommended therefore the risk of surface water flooding post-development shall not be increased and shall be reduced where possible.
- 5.4.3 It is assumed that the surface water drainage outside of the site boundary will be subject to the relevant landowner's regular drainage maintenance schedule.
- 5.4.4 United Utilities have not advised of any sewer flooding or surcharged sewers to those in the vicinity of the site.
- 5.4.5 Non return valves are to be included within the design to prevent sewer surcharging into the private drainage network.
- 5.4.6 Should a connection to public sewer be proposed, United Utilities are to confirm if a surcharged outfall (depth to be confirmed) is required as a precautionary measure in the 1 in 30 and 1 in 100 year plus climate change storm event.
- 5.4.7 Providing the above measures were imposed, the risk to the development from surface water flooding would be considered to be low, post development.

5.5 Surface Water Flooding from the site Mitigation

- 5.5.1 Any new development site drainage should be designed in accordance with current best practice to provide adequate capacity not to flood in a 30 year storm event and flood water generated up to the critical 1 in 100 year plus climate change storm event shall be controlled and constrained within areas on site so as not to cause damage to buildings, essential services or adjoining developments and services.
- 5.5.2 Climate change allowances for peak rainfall intensities which should be applied to new developments.
- 5.5.3 Table 4a & 4b below (Extract of the Environment Agency Guidance) demonstrates the climate change allowance with central and upper end allowances being considered.

- 5.5.4 Based on the nature of the development, a lifespan in excess of 60 years is anticipated. Therefore, the potential climate change allowance for 2061-2115 ranges between 30% for the central allowance and 45% for the upper end allowance. As such, an allowance of 45% for climate change on peak rainfall intensity will be included in the calculations.

Irwell Management Catchment peak rainfall allowances		
3.3% annual exceedance rainfall event		
Epoch	Central allowance	Upper end allowance
2050s	25%	35%
2070s	30%	40%
1% annual exceedance rainfall event		
Epoch	Central allowance	Upper end allowance
2050s	25%	40%
2070s	30%	45%
*Use '2050s' for development with a lifetime up to 2060 and use the 2070s epoch for development with a lifetime between 2061 and 2125.		
This map contains information generated by Met Office Hadley Centre (2019): UKCP Local Projections on a 5km grid over the UK for 1980-2080. Centre for Environmental Data Analysis, 2022		

Table 4a – EA Climate change allowance.

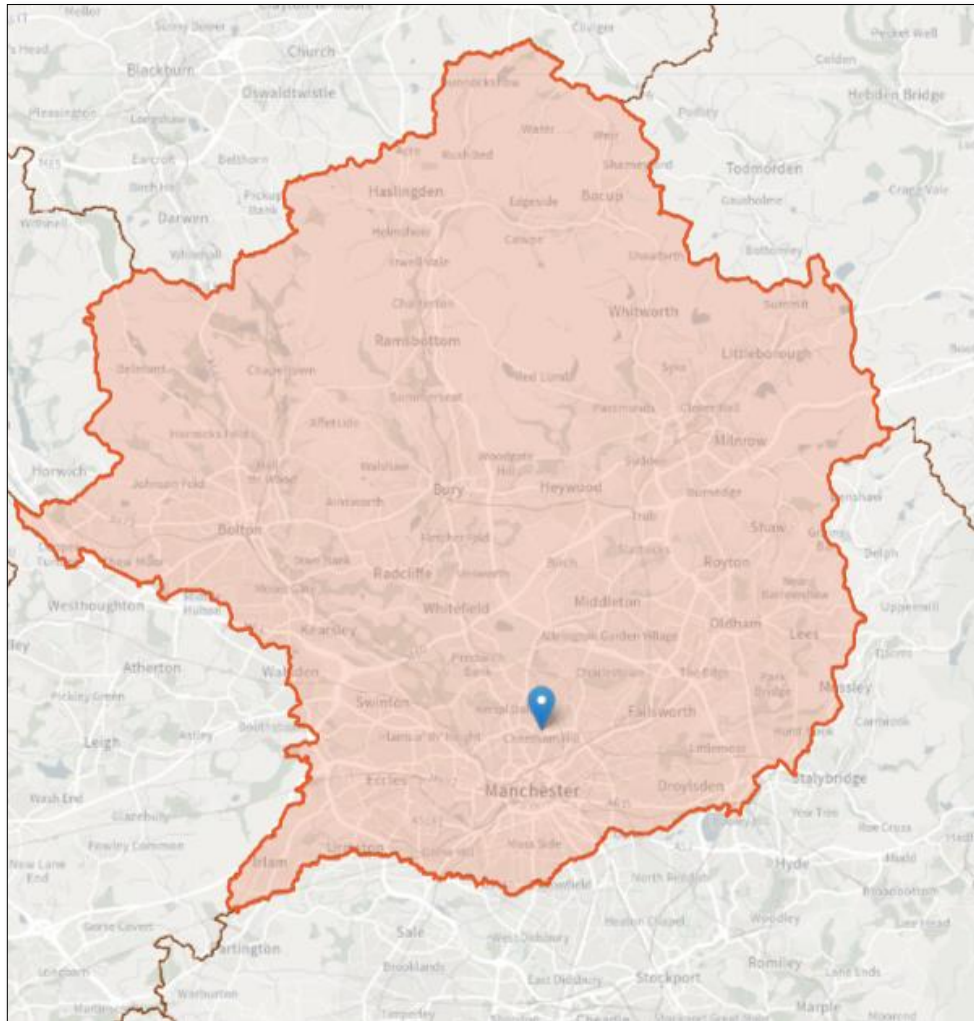


Table 4b – EA Climate change allowance Map.

- 5.5.5 Section 6 reviews the surface water discharge options and it is proposed that the surface water will outfall into the combined public sewer in Heywood Street, subject to infiltration testing and agreement with United Utilities and Manchester Lead Local Flood Authority (LLFA).
- 5.5.6 To minimise localised flooding within the site, the drainage design should ensure that any drainage features are suitably sized to accommodate peak storm flows.
- 5.5.7 Flood water exceedance routes should be identified, both on and off site. Refer to Appendix I for flood exceedance plan.
- 5.5.8 For any sustainable drainage systems (SuDS) employed in the development, an appropriate management and maintenance plan for the SuDS lifetime should be submitted and include;
- Any arrangements for adoption by an appropriate public body or statutory undertaker, management and maintenance by Residents Management Company.

- Arrangements concerning appropriate funding mechanisms for its on-going maintenance of all elements of the SuDS system (i.e. regular inspection and maintenance).
- Means of access for maintenance and easements where applicable.

5.5.9 Assuming the proposed drainage system is designed to provide adequate capacity, and that the private and adopted sewers are maintained, it can be assumed risk of flooding from blocked or overloading is minimal.

5.5.10 The final design of the drainage network shall be in accordance with the legislation set by the Environment Agency, Manchester City Council and United Utilities.

6 DRAINAGE STRATEGY

6.1 Existing Drainage

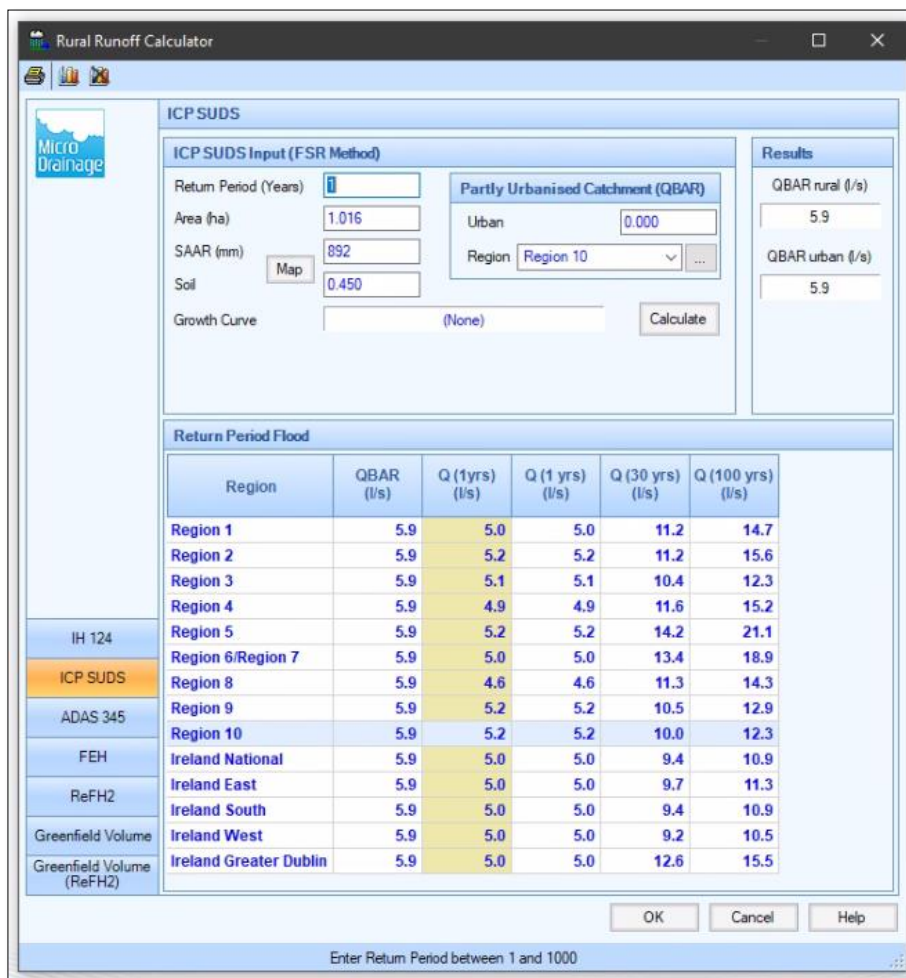
6.1.1 Refer to Section 2.3 for existing drainage.

6.1.2 Existing drainage records can be found in Appendix C of this report.

6.1.3 The site area is 1.28ha made up of c.80% soft scape and c.20% hardstanding, therefore we have classed this as a greenfield site. The existing hard standing to the north is a private road and sports court area (0.26ha), where gullies are expected to collect and convey surface water flows to the public combined sewer. The existing soft landscaped areas make up the remainder of the site (1.02ha).

6.1.4 The existing hard standing area would generate 35 l/s, calculated using the Wallingford Modified Ration Method for the 1-year peak flow. (2.78x0.75x1.3x0.26hx50mm/hr).

6.1.5 The existing soft landscaped area would generate 5.2 l/s, 10.0 l/s and 12.3 l/s for the 1, 30 and 100 year events calculated using Micro drainage Rural Runoff Calculator (ICP SUDS). See below.



The screenshot shows the 'Rural Runoff Calculator' software interface. The 'ICP SUDS' tab is selected. The 'ICP SUDS Input (FSR Method)' section contains the following fields:

- Return Period (Years): 1
- Area (ha): 1.016
- SAAR (mm): 892
- Soil: 0.450
- Growth Curve: (None)
- Partly Urbanised Catchment (QBAR): Urban 0.000, Region Region 10
- Calculate button

The 'Results' section shows:

- QBAR rural (l/s): 5.9
- QBAR urban (l/s): 5.9

The 'Return Period Flood' table is displayed below:

Region	QBAR (l/s)	Q (1yrs) (l/s)	Q (1 yrs) (l/s)	Q (30 yrs) (l/s)	Q (100 yrs) (l/s)
Region 1	5.9	5.0	5.0	11.2	14.7
Region 2	5.9	5.2	5.2	11.2	15.6
Region 3	5.9	5.1	5.1	10.4	12.3
Region 4	5.9	4.9	4.9	11.6	15.2
Region 5	5.9	5.2	5.2	14.2	21.1
Region 6/Region 7	5.9	5.0	5.0	13.4	18.9
Region 8	5.9	4.6	4.6	11.3	14.3
Region 9	5.9	5.2	5.2	10.5	12.9
Region 10	5.9	5.2	5.2	10.0	12.3
Ireland National	5.9	5.0	5.0	9.4	10.9
Ireland East	5.9	5.0	5.0	9.7	11.3
Ireland South	5.9	5.0	5.0	9.4	10.9
Ireland West	5.9	5.0	5.0	9.2	10.5
Ireland Greater Dublin	5.9	5.0	5.0	12.6	15.5

The software interface also includes a sidebar with various tabs (IH 124, ICP SUDS, ADAS 345, FEH, ReFH2, Greenfield Volume, Greenfield Volume (ReFH2)) and buttons for OK, Cancel, and Help. A status bar at the bottom indicates 'Enter Return Period between 1 and 1000'.

6.1.6 Refer to Appendix D for Catchments Plan.

6.2 Proposed Foul Water Drainage

6.2.1 It is proposed to separate foul and surface water networks within the development.

6.2.2 The foul water from the development is proposed to discharge via new and existing combined connections to the combined public sewer located to the east of the site in Heywood Street.

6.2.3 It is assumed that United Utilities will accept foul flows from the development into the public sewer at an unrestricted rate. United Utilities have confirmed the following;

... 'Foul flow from this site will be allowed to drain into the public foul water/combined sewer system. Our preferred point of discharge would be to the 375mm diameter public foul water/combined sewer located to the north of your proposed development. 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'.....

6.2.4 Site levels when compared to that of the existing combined public sewer, verify that a foul gravity connection can be achieved with no requirement for pumping.

6.2.5 It is anticipated that the network will connect to the public combined sewer network therefore approval will be required from United Utilities for any additional uplift in foul flows.

6.2.6 There are no proposals for foul water drainage to be adopted at this stage however should this change as the scheme develops, proposals will be subject to a Section 104 Agreement with United Utilities. Easements will be required for adopted sewers within private land. Where drainage is to remain private, connection to the public sewer will be subject to a Section 106 Agreement with United Utilities.

6.2.7 The proposed Drainage Strategy layout is enclosed in Appendix I.

6.3 Proposed Surface Water Drainage

6.3.1 Any new development site drainage should be designed in accordance with current best practice to provide adequate capacity not to flood in a 30 year storm event and flood water generated up to the critical 1 in 100 year plus climate change storm event shall be controlled and constrained within areas on site so as not to cause damage to buildings, essential services or adjoining developments and services.

6.3.2 Based on the nature of the development, a lifespan in excess of 60 years is anticipated. Therefore, the potential climate change allowance for 2061-2115 ranges between 20% for the central allowance and 45% for the upper end allowance. As such, an allowance of 45% for climate change on peak rainfall intensity will be included in the calculations.

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

Infiltration

- 6.3.4 The first consideration for discharging surface water should be via infiltration.
- 6.3.5 Infiltration testing in accordance with BRE Digest 365 is due to commence on 9th January 2023 with results available on 16th January 2023. This will include infiltration testing to BRE365 to definitely confirm if infiltration is feasible.
- 6.3.6 The available ground investigation data for the site indicates a depth of made ground overlying clay soils with groundwater encountered. On this basis, infiltration, appears to be unlikely on the site. For this reason, we have developed the drainage strategy based on an attenuation system with discharge at reduced/agreed rate (in principle) into the public sewer.
- 6.3.7 The next consideration for surface water discharge should be watercourse.

Watercourse

- 6.3.8 The River Irk is the nearest watercourse to the site and is located c.1km away from the development site therefore disposal of surface water to watercourse is considered not feasible.
- 6.3.9 The next consideration for surface water discharge should be surface water sewer.

Surface Water Sewers

- 6.3.10 There are no surface water sewers in the vicinity of the site.
- 6.3.11 The next consideration for surface water discharge should be combined water sewer.

Combined Sewers

- 6.3.12 There are existing public sewers surrounding the site as detailed in section 2.3. A predevelopment enquiry has been issued to United Utilities confirming the preferred location of discharge to the public sewer.
- 6.3.13 Should infiltration be deemed not suitable for this site; it is proposed to connect surface water flows to the public combined sewer in Heywood Street. At this stage, as we cannot confirm if infiltration is suitable, a drainage strategy has been developed discharging to public sewer, as we can confirm this strategy is deliverable.
- 6.3.14 The above discharge point is to be agreed with both United Utilities and Manchester LLFA.
- 6.3.15 United Utilities have confirmed the following in their predevelopment response. Refer to Appendix G for full correspondence.

.....'United Utilities will consider a connection to the 450mm diameter public combined sewer within Heywood Street located to the east of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5 l/s for any storm event'.....

6.3.16 Manchester LLFA have been contacted however at the time of writing this report, a response has not been received. It is assumed that should infiltration testing prove not suitable, 5 l/s as a pass forward flow will be acceptable.

6.3.17 The proposed discharge rate is 5 l/s to public combined sewer.

6.3.18 Its worth noting that the proposed discharge rate (for all storms) provides a minimum 30 l/s betterment on the existing 1 year peak discharge rate and a greater betterment in the 2, 30 and 100 year events.

6.3.19 The remaining undeveloped area 0.68ha (i.e. soft landscaping) will generate 3.5 l/s, 6.7 l/s and 8.3 l/s for the 1, 30 and 100 year events calculated using Micro drainage Rural Runoff Calculator (ICP SUDS). This area will not be positively drained and will seep into the ground. See below.

The screenshot shows the 'Rural Runoff Calculator' software interface. The 'ICP SUDS' section is active, displaying input fields for 'Return Period (Years)', 'Area (ha)', 'SAAR (mm)', 'Soil', and 'Growth Curve'. The 'Partly Urbanised Catchment (QBAR)' section shows 'Urban' as 0.000 and 'Region' as 'Region 10'. The 'Results' section shows 'QBAR rural (l/s)' as 4.0 and 'QBAR urban (l/s)' as 4.0. Below this is a 'Return Period Flood' table with columns for Region, QBAR (l/s), Q (1 yrs) (l/s), Q (30 yrs) (l/s), and Q (100 yrs) (l/s). The table lists various regions and their corresponding values. At the bottom, there are 'OK', 'Cancel', and 'Help' buttons, and a note to 'Enter Return Period between 1 and 1000'.

Region	QBAR (l/s)	Q (1 yrs) (l/s)	Q (30 yrs) (l/s)	Q (100 yrs) (l/s)
Region 1	4.0	3.4	3.4	9.8
Region 2	4.0	3.5	3.5	10.4
Region 3	4.0	3.4	3.4	8.3
Region 4	4.0	3.3	3.3	10.2
Region 5	4.0	3.5	3.5	14.1
Region 6/Region 7	4.0	3.4	3.4	12.7
Region 8	4.0	3.1	3.1	9.6
Region 9	4.0	3.5	3.5	8.6
Region 10	4.0	3.5	3.5	8.3
Ireland National	4.0	3.4	3.4	7.3
Ireland East	4.0	3.4	3.4	7.5
Ireland South	4.0	3.4	3.4	7.3
Ireland West	4.0	3.4	3.4	7.1
Ireland Greater Dublin	4.0	3.4	3.4	10.4

6.3.20 The proposed site impermeable area is 0.6ha. A quick storage estimate has been calculated using hydraulic modelling software. Based on 5 l/s and 1 in 100 year plus 45% climate change a maximum storage volume of circa 400m³ to be attenuation on site below ground.

6.3.21 The above volumes have been confirmed within the Hydraulic Calculations. See Appendix H.

- 6.3.22 The proposed surface water catchments should be restricted to the above-mentioned flows using flow control devices i.e. Hydro-brake or similar approved.
- 6.3.23 Attenuation for the required storage volumes is to be housed in below ground storage i.e. Cellular Storage and Permeable surfacing sub-base voids.
- 6.3.24 Surface water run-off from any impermeable areas at risk of contamination should receive water quality treatment. Roof drainage is considered very low hazard and external areas with the site boundary i.e. footways and residential car parks are considered to be low risk, in terms of contamination.
- 6.3.25 Figure 8 illustrates the pollution hazard indices for the different land use classifications from the CIRIA SuDS Manual C753 (2015).

TABLE 26.2 Pollution hazard indices for different land use classifications				
Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways ¹	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways ¹	High	0.8 ²	0.8 ²	0.9 ²

Figure 8 – CIRIA Pollution Hazard Indices.

- 6.3.26 Figure 9 illustrates the SuDS Component mitigation indices from the CIRIA SuDS Manual C753 (2015).

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters

Type of SuDS component	Mitigation indices ¹		
	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4 ²	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond ⁴	0.7 ³	0.7	0.5
Wetland	0.8 ³	0.8	0.8
Proprietary treatment systems ^{5,6}	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Notes

- 1 SuDS components only deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters.
- 2 Filter drains can remove coarse sediments, but their use for this purpose will have significant implications with respect to maintenance requirements, and this should be taken into account in the design and Maintenance Plan.
- 3 Ponds and wetlands can remove coarse sediments, but their use for this purpose will have significant implications with respect to the maintenance requirements and amenity value of the system. Sediment should normally be removed upstream, unless they are specifically designed to retain sediment in a separate part of the component, where it cannot easily migrate to the main body of water.
- 4 Where a wetland is not specifically designed to provide significantly enhanced treatment, it should be considered as having the same mitigation indices as a pond.
- 5 See **Chapter 14** for approaches to demonstrate product performance. A British Water/Environment Agency assessment code of practice is currently under development that will allow manufacturers to complete an agreed test protocol for systems intended to treat contaminated surface water runoff. Full details can be found at: <http://tinyurl.com/qf7yuj7>
- 6 SEPA only considers proprietary treatment systems as appropriate in exceptional circumstances where other types of SuDS component are not practicable. Proprietary treatment systems may also be considered appropriate for existing sites that are causing pollution where there is a requirement to retrofit treatment. SEPA (2014) also provides a flowchart with a summary of checks on suitability of a proprietary system.

Figure 9 – CIRIA SuDS Mitigation Indices.

6.3.27 The selection of treatment should ensure that the SuDS Mitigation component index exceeds the pollution hazard index. Where two stages of treatment are required, the second stage of treatment should account for reduced performance due to lower inflows; therefore 0.5 (mitigation index) should be used.

6.3.28 The proposed development has a car parking area. This area is currently shown at <800m². Therefore, it is proposed to include permeable surfacing as a level of treatment for this area to mitigate the risk of contaminants being washed to the combined public sewer, should these spillages occur during rainfall events. As a second stage of treatment a Smartsponge Filter is also proposed.

6.3.29 It is recommended that spillages within these car park areas are treated locally and disposed of correctly in accordance with the proposals set out in the maintenance strategy section, to further prevent risk of contamination to the public sewers.

- 6.3.30 The proposals for pollution protected should be agreed with the UU and LLFA.
- 6.3.31 There are no proposals for surface water drainage to be adopted at this stage however should this change as the scheme develops, proposals will be subject to a Section 104 Agreement with United Utilities. Easements will be required for adopted sewers within private land. Where drainage is to remain private, connection to the public sewer will be subject to a Section 106 Agreement with United Utilities.
- 6.3.32 The final design of the drainage network shall be in accordance with the legislation set by the Environment Agency, Manchester City Council and United Utilities.

6.4 Sustainable Drainage System (SuDS)

- 6.4.1 Green infrastructure should always be considered at early stages of design. The benefit green infrastructure has on the environment are considered extremely positive. Green infrastructure such as Ponds, Swales and SuDS roofs (Green/blue/brown roofs) have been considered for this scheme.
- 6.4.2 Given the nature of the development (Infant and Junior School), green infrastructure i.e. ponds and swales have been considered however discounted with the safety of its users (children attending the school) using the space.
- 6.4.3 Consideration and likelihood of vulnerable people falling into open ponds/swales is high (especially if unattended) and the outcome could be fatal, therefore by adding open water features such as ponds etc would only increase the risk of potentially fatal accidents.
- 6.4.4 Above ground SuDS i.e. green/blue/brown roofs etc have also been considered however discounted due to the type of proposed pitched roofs for the new buildings not being suitable to house these types of SuDS.
- 6.4.5 As part of the drainage strategy, we will be proposing permeable surfacing, green landscaped areas, rain gardens, attenuation in the form of cellular storage and flow restrictions, to maximise sustainable drainage where possible.
- 6.4.6 Refer to Appendix I for the Drainage Strategy Layout.
- 6.4.7 Hydraulic calculation have been included in Appendix H.
- 6.4.8 Refer to Appendix K for SuDS Proforma as required by the LLFA.

7 MAINTENANCE

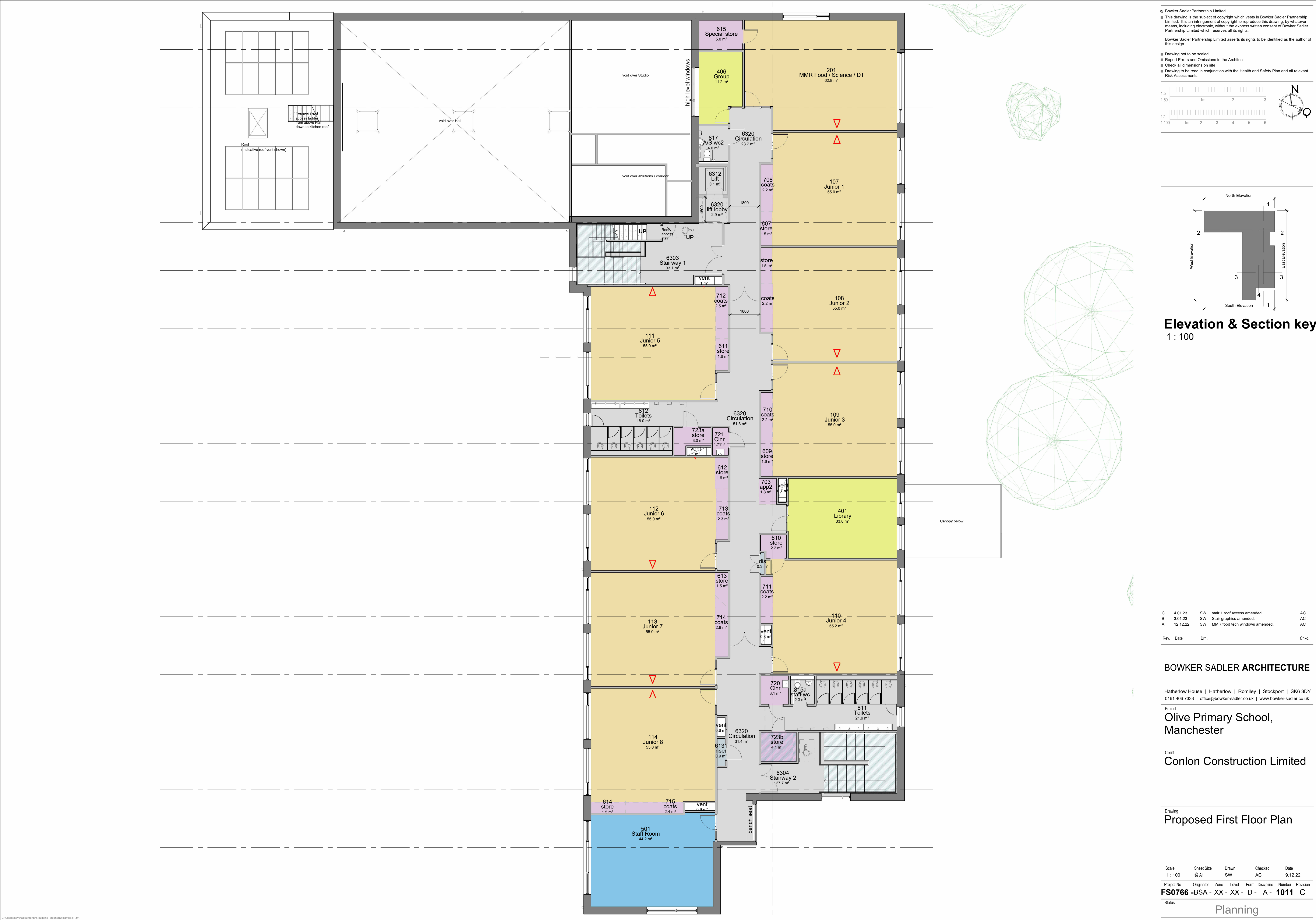
7.1 Strategy

- 7.1.1 All onsite drainage systems will be privately maintained, and a specialist management company will be appointed to oversee the maintenance of these. A long-term maintenance regime should be implemented for the lifetime of the development. In addition to a long-term maintenance regime, it is recommended that all drainage elements implemented on site should be inspected following the first rainfall event post-construction and monthly for the first quarter following construction.
- 7.1.2 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 events. Significant sediment deposition is likely in areas used for storage, so a post clean-up operation may be required including the removal of little vegetation, sewerage debris and larger objects.
- 7.1.3 Proposals to deal with spillages within car parking areas from vehicles should be confirmed and agreed by the management company.
- 7.1.4 The Maintenance Strategy document should be developed as the scheme progresses following confirmation of all SuDS features and proprietary products being selected.
- 7.1.5 The Maintenance Strategy should form part of the building O&M manual and all the measures and designs will need to be adhered to in order to maintain the design life and design capacity of the surface and foul water drainage systems.
- 7.1.6 Refer to Appendix J for Outline Drainage Maintenance Strategy.

7.2 SuDS and Drainage Features

- 7.2.1 Photographic evidence should be provided of all installed drainage features by the selected contractor. This evidence is to be included in the O&M manual along with the Drainage Maintenance Strategy.

Appendix A – Proposed Development Plans.





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Drawing not to be scaled

Report Errors and Omissions to the Architect.

Check all dimensions on site

Drawing to be read in conjunction with the Health and Safety Plan and all relevant Risk Assessments

1:50

1:100

1m

2m

3m

4m

5m

6m

N

Q

00 Proposed Site Plan - Roof
1 : 500

BOWKER SADLER ARCHITECTURE

Hatherlow House | Hatherlow | Romiley | Stockport | SK6 3DY
0161 406 7333 | office@bowker-sadler.co.uk | www.bowker-sadler.co.uk

Project
Olive Primary School,
Manchester

Client
Conlon Construction Limited

Drawing
Proposed Site Plan - Roof

Scale 1 : 500	Sheet Size @ A1	Drawn SW	Checked AC	Date 8.12.22
Project No. FS0766	Originator -BSA-	Zone XX	Level -XX-	Form D -
Status	Discipline A -	Number 1004	Revision C	

Planning

Appendix B – Topographical Survey.



OS Note:
Some services may have been omitted due to parked vehicles.
The Ordnance Survey tile is to be used as a guide only.

OS Buildings  Surveyed Buildings 

This survey has been orientated to the Ordnance Survey (O.S.) National Grid OSGB36(15) via Global Navigational Satellite Systems (GNSS) and the O.S. Active Network (OS Net).

A true OSGB36 coordinate has been established near to the site centre via a transformation using the OSTN15GB & OSGM15GB transformation models. The survey has been correlated to this point and a further one or more OSGB36 (15) points established to create a true O.S. bearing for angle orientation.

No scale factor has been applied to the survey therefore the coordinates shown are arbitrary & not true O.S. Coordinates which have a scale factor applied.

Please refer to Survey Station Table to enable establishment of the on-site grid and datum.

Legend:

[illegible]

Rev	Date	Description	Drawn	Q. Re
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greenhatch
group

- Topographical Surveys
- Site Engineering
- Utility / CCTV Surveys
- Measured Building Surveys
- 3D Laser Scanning
- Revit & BIM Models

24 Riverside Studios
Amethyst Road
Newcastle Business Park
Newcastle
NE4 7YL
t. (0191) 273 6391
newcastle@greenhatch-group.co.uk
www.greenhatch-group.co.uk

Derby (Head Office)	St Albans	London
Rowan House Duffield Road Little Eaton Derby DE21 5DR	Unit B, The Courtyard Alban Park St Albans Hertfordshire AL4 0LA	27 Cornwall Terrace Me Regents Park London NW1 5LL
t. (0133) 283 0044	t. (0172) 785 4481	t. (0207) 224 1806

CLIENT

**Mott
MacDonald**

PROJECT
Olive Manchester
Bignor Street, Cheetham Hill
Manchester, M8 0SE

TITLE **Topographical Survey**

SCALE A2@ 1: 500	DATE 04.12.20
DRAWN JC	QUALITY REF GH9152

<i>Level datum</i>	<i>See notes</i>
<i>Grid orientation</i>	<i>See notes</i>
<i>Job number</i>	38686

Drawing No.	Rev.
38686 T	0

Comments

This plan should only be used for its original purpose. Greenhatch Group accepts no responsibility for this plan if supplied to any party other than the original client.

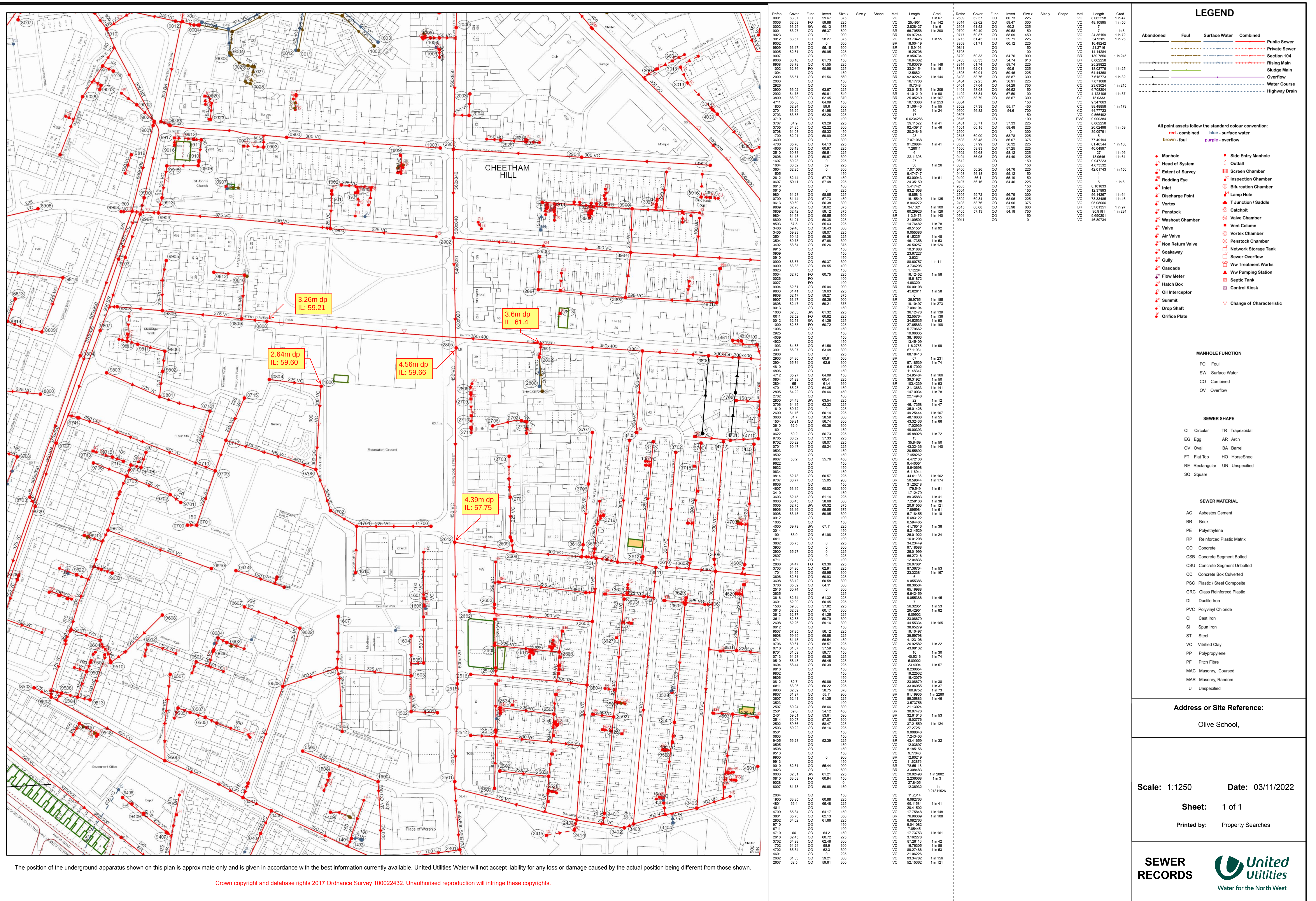
All dimensions should be checked on site prior to design and construction.

Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

Notes:

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Appendix C – United Utilities Sewer Records, CCTV Survey.





Project

Project Name: 2020_12_14 MOTT MCDONALD STAR OLIVE MANCHESTER
Project Date: 14/12/2020
Inspection Standard: MSCC5 Sewers & Drainage GB (SRM5 Scoring)

Table of Contents

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2020_12_14 MOTT MCDONALD STAR OLIVE MANCHESTER		14/12/2020

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Section: 3; MH05 > MH04 (MH05X)	8
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Project Information

Project Name	Project Number	Project Date
2020_12_14 MOTT MCDONALD STAR OLIVE MANCHESTER		14/12/2020

Contractor

Company: Underground Surveys (UK) Limited
Street: Unit CG17 & 18 Warrington Business Park
Town or City: Long Lane, Warrington
County: Cheshire
Post Code: WA2 8TX
Phone: 01925 444664
Email: info@undergroundsurveys.co.uk



Project Information

Project Name	Project Number	Project Date
2020_12_14 MOTT MCDONALD STAR OLIVE MANCHESTER		14/12/2020

Project Drawing, Page 'undefined'



Scoring Summary

Project Name 2020_12_14 MOTT MCDONALD STAR OLIVE MANCHESTER	Project Number	Project Date 14/12/2020
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Structural Defects

- Grade 3: Best practice suggests consideration should be given to repairs in the medium term.
- Grade 4: Best practice suggests consideration should be given to repairs to avoid a potential collapse.
- Grade 5: Best practice suggests that this pipe is at risk of collapse at any time. Urgent consideration should be given to repairs to avoid total failure.

Section	PLR	Grade	Description
1	MH01X	4	Multiple defects
6	MH08X	3	Multiple defects

Service / Operational Condition

- Grade 3: Best practice suggests consideration should be given to maintenance activities in the medium term.
- Grade 4: Best practice suggests consideration should be given to maintenance activity to avoid potential blockages.
- Grade 5: Best practice suggests that this pipe is at a high risk of backing up or causing flooding.

Section	PLR	Grade	Description
1	MH01X	4	Settled deposits, other, 20% cross-sectional area loss
2	MH03X	4	Settled deposits, coarse, 20% cross-sectional area loss
3	MH05X	4	Settled deposits, coarse, 30% cross-sectional area loss
4	MH06X	3	Multiple defects
5	MH07X	4	Settled deposits, coarse, 20% cross-sectional area loss
6	MH08X	4	Multiple defects

Abandoned Surveys

Section	PLR	Description
6	MH08X	Survey abandoned
6	MH08X	Survey abandoned

Information

These scoring summaries are based on the SRM grading from the WRC.

Section Profile

Project Name 2020_12_14 MOTT MCDONALD STAR OLIVE MANCHESTER	Project Number	Project Date 14/12/2020
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Circular, 225 mm

Item No.	Upstream Node	Downstream Node	Date	Road	Material	Total Length	Inspected Length
4	MH06	MH05	14/12/2020	TAMERTON DRIVE	Vitrified clay	22.15 m	22.15 m
5	MH07	MH06	14/12/2020	TAMERTON DRIVE	Vitrified clay	54.61 m	54.61 m

Total: 2 Inspections x Circular 225 mm = 76.76 m Total Length and 76.76 m Inspected Length

Circular, 300 mm

Item No.	Upstream Node	Downstream Node	Date	Road	Material	Total Length	Inspected Length
2	MH03	MH04	14/12/2020	TAMERTON DRIVE	Concrete	66.51 m	66.51 m
3	MH05	MH04	14/12/2020	TAMERTON DRIVE	Concrete	28.93 m	28.93 m

Total: 2 Inspections x Circular 300 mm = 95.43 m Total Length and 95.43 m Inspected Length

Circular, 450 mm

Item No.	Upstream Node	Downstream Node	Date	Road	Material	Total Length	Inspected Length
6	MH08	MH09	14/12/2020	HAYWOOD STREET	Vitrified clay	100.00 m	45.06 m
6	MH08	MH09	14/12/2020	HAYWOOD STREET	Vitrified clay	100.00 m	6.99 m

Total: 2 Inspections x Circular 450 mm = 100.00 m Total Length and 52.06 m Inspected Length

U-Shaped with flat top, 450 mm, 375 mm

Item No.	Upstream Node	Downstream Node	Date	Road	Material	Total Length	Inspected Length
1	MH01	MH02	14/12/2020	BIGNOR STREET	Brick	206.79 m	206.79 m

Total: 1 Inspection x U-Shaped with flat top 450 mm, 375 mm = 206.79 m Total Length and 206.79 m Inspected Length

Total: 7 Inspections = 478.98 m Total Length and 431.03 m Inspected Length

Section Summary

Project Name	Project Number	Project Date
2020_12_14 MOTT MCDONALD STAR OLIVE MANCHESTER		14/12/2020

Number of sections	6
Total length of sections	478.98 m
Total length of inspected sections	431.03 m
Total length of abandoned inspections	47.95 m
Number of abandoned inspections	2
Number of section inspection photos	7
Number of section inspection videos	7
Number of section inspection scans	0
Number of section inclination measurements	0

PLR:	MH01X	Upstream Node:	MH01
Inspection Direction:	Downstream	Downstream Node:	MH02
Inspected Length:	206.79 m	Dia/Height:	450 mm
Total Length:	206.79 m	Material:	Brick

No.	m+	Code	Observation
1	0.00	MH	Start node type, manhole, reference number: MH01
2	0.00	WL	Water level, 10% of the vertical dimension
3	4.06	DEX	Settled deposits, other, 10% cross-sectional area loss, FOUL
4	6.27	CN	Connection other than junction at 9 o'clock, diameter: 225mm
5	8.19	DEX	Settled deposits, other, 10% cross-sectional area loss, start, FOUL
6	17.04	JN	Junction at 3 o'clock, diameter: 150mm, LIVE
7	18.43	JN	Junction at 9 o'clock, diameter: 150mm
8	19.22	CN	Connection other than junction at 9 o'clock, diameter: 225mm
9	25.61	REM	General remark, OLD SHAFT
10	29.45	CN	Connection other than junction at 9 o'clock, diameter: 150mm
11	35.49	DB	Displaced bricks from 7 o'clock to 8 o'clock
12	39.33	DB	Displaced bricks from 4 o'clock to 5 o'clock
13	41.83	DB	Displaced bricks from 7 o'clock to 8 o'clock
14	43.20	DB	Displaced bricks from 4 o'clock to 5 o'clock
15	44.33	MB	Missing bricks from 4 o'clock to 5 o'clock
16	46.79	SC	Pipe size changes, new size(s), 375mm high
17	46.79	MCVC	Pipe material changes to vitrified clay at this point
18	48.88	JN	Junction at 9 o'clock, diameter: 225mm
19	52.43	JN	Junction at 2 o'clock, diameter: 150mm
20	62.70	MCCI	Pipe material changes to cast iron at this point
21	65.40	MCVC	Pipe material changes to vitrified clay at this point

Section Summary

Project Name 2020_12_14 MOTT MCDONALD STAR OLIVE MANCHESTER	Project Number	Project Date 14/12/2020
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No.	m+	Code	Observation
22	65.47	JN	Junction at 3 o'clock, diameter: 225mm, CAPPED
23	75.63	JN	Junction at 9 o'clock, diameter: 100mm
24	81.25	JN	Junction at 2 o'clock, diameter: 150mm
25	104.88	JN	Junction at 3 o'clock, diameter: 150mm
26	115.55	JN	Junction at 9 o'clock, diameter: 100mm
27	128.48	JN	Junction at 3 o'clock, diameter: 150mm
28	129.22	JN	Junction at 3 o'clock, diameter: 150mm
29	132.70	RFJ	Roots, fine at joint
30	133.30	RFJ	Roots, fine at joint
31	134.70	JN	Junction at 9 o'clock, diameter: 100mm
32	153.06	JN	Junction at 9 o'clock, diameter: 150mm
33	153.76	JN	Junction at 9 o'clock, diameter: 100mm
34	156.73	JN	Junction at 9 o'clock, diameter: 150mm
35	156.73	RF	Roots, fine
36	159.74	JN	Junction at 3 o'clock, diameter: 150mm
37	176.03	JN	Junction at 9 o'clock, diameter: 150mm
38	176.58	CCJ	Crack, circumferential at joint from 7 o'clock to 12 o'clock
39	183.57	RFJ	Roots, fine at joint
40	184.42	DEX	Settled deposits, other, 20% cross-sectional area loss, FOUL
41	185.76	CN	Connection other than junction at 9 o'clock, diameter: 100mm
42	185.76	FL	Fracture, longitudinal at 10 o'clock
43	195.60	IDJ	Infiltration, dripping at joint at 10 o'clock
44	197.91	DEEJ	Attached deposits, encrustation at joint from 8 o'clock to 9 o'clock, 5% cross-sectional area loss
45	199.65	JN	Junction at 3 o'clock, diameter: 150mm
46	202.73	JN	Junction at 3 o'clock, diameter: 150mm
47	206.79	MHF	Finish node type, manhole, reference number: MH02
48	206.79	DEX	Settled deposits, other, 10% cross-sectional area loss, finish, FOUL

PLR:	MH03X	Upstream Node:	MH03
Inspection Direction:	Upstream	Downstream Node:	MH04
Inspected Length:	66.51 m	Dia/Height:	300 mm
Total Length:	66.51 m	Material:	Concrete

No.	m+	Code	Observation
1	0.00	MH	Start node type, manhole, reference number: MH04
2	0.00	WL	Water level, 10% of the vertical dimension
3	0.80	DER	Settled deposits, coarse, 10% cross-sectional area loss, start, PATCHY
4	4.66	WL	Water level, 5% of the vertical dimension
5	4.66	DER	Settled deposits, coarse, 10% cross-sectional area loss, finish, PATCHY
6	9.26	CN	Connection other than junction at 12 o'clock, diameter: 100mm, LIVE
7	26.44	DER	Settled deposits, coarse, 5% cross-sectional area loss
8	29.39	IRJ	Infiltration, running at joint from 10 o'clock to 2 o'clock
9	42.05	DER	Settled deposits, coarse, 5% cross-sectional area loss, start, PATCHY
10	49.57	CN	Connection other than junction at 12 o'clock, diameter: 100mm
11	54.03	DER	Settled deposits, coarse, 5% cross-sectional area loss, finish, PATCHY

Section Summary

Project Name 2020_12_14 MOTT MCDONALD STAR OLIVE MANCHESTER	Project Number	Project Date 14/12/2020
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No.	m+	Code	Observation
12	54.03	DER	Settled deposits, coarse, 20% cross-sectional area loss
13	55.63	DER	Settled deposits, coarse, 10% cross-sectional area loss
14	57.07	CN	Connection other than junction at 12 o'clock, diameter: 100mm
15	66.51	MHF	Finish node type, manhole, reference number: MH03

PLR:	MH05X	Upstream Node:	MH05
Inspection Direction:	Upstream	Downstream Node:	MH04
Inspected Length:	28.93 m	Dia/Height:	300 mm
Total Length:	28.93 m	Material:	Concrete

No.	m+	Code	Observation
1	0.00	MH	Start node type, manhole, reference number: MH04
2	0.00	WL	Water level, 5% of the vertical dimension
3	8.27	DER	Settled deposits, coarse, 5% cross-sectional area loss
4	8.27	CN	Connection other than junction at 12 o'clock, diameter: 100mm, LIVE
5	8.27	DEEJ	Attached deposits, encrustation at joint from 7 o'clock to 5 o'clock, 5% cross-sectional area loss
6	9.93	DER	Settled deposits, coarse, 10% cross-sectional area loss, start, PATCHY
7	26.78	CN	Connection other than junction at 2 o'clock, diameter: 100mm
8	26.78	DEE	Attached deposits, encrustation from 2 o'clock to 5 o'clock, 10% cross-sectional area loss
9	28.42	DER	Settled deposits, coarse, 30% cross-sectional area loss
10	28.93	DER	Settled deposits, coarse, 10% cross-sectional area loss, finish, PATCHY
11	28.93	MHF	Finish node type, manhole, reference number: MH05

PLR:	MH06X	Upstream Node:	MH06
Inspection Direction:	Downstream	Downstream Node:	MH05
Inspected Length:	22.15 m	Dia/Height:	225 mm
Total Length:	22.15 m	Material:	Vitrified clay

No.	m+	Code	Observation
1	0.00	MH	Start node type, manhole, reference number: MH06
2	0.00	WL	Water level, 10% of the vertical dimension
3	0.70	DER	Settled deposits, coarse, 10% cross-sectional area loss, start, PATCHY
4	20.37	CN	Connection other than junction at 11 o'clock, diameter: 100mm, LIVE
5	20.37	DEEJ	Attached deposits, encrustation at joint from 9 o'clock to 3 o'clock, 20% cross-sectional area loss
6	22.14	DER	Settled deposits, coarse, 10% cross-sectional area loss, finish, PATCHY
7	22.15	MHF	Finish node type, manhole, reference number: MH05

PLR:	MH07X	Upstream Node:	MH07
Inspection Direction:	Upstream	Downstream Node:	MH06
Inspected Length:	54.61 m	Dia/Height:	225 mm
Total Length:	54.61 m	Material:	Vitrified clay

No.	m+	Code	Observation
1	0.00	MH	Start node type, manhole, reference number: MH06
2	0.00	WL	Water level, 10% of the vertical dimension
3	0.70	DER	Settled deposits, coarse, 10% cross-sectional area loss, start, PATCHY
4	3.70	CN	Connection other than junction at 12 o'clock, diameter: 100mm
5	3.70	DEE	Attached deposits, encrustation from 7 o'clock to 5 o'clock, 5% cross-sectional area loss

Section Summary

Project Name 2020_12_14 MOTT MCDONALD STAR OLIVE MANCHESTER	Project Number	Project Date 14/12/2020
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No.	m+	Code	Observation
6	4.22	CN	Connection other than junction at 12 o'clock, diameter: 100mm, LIVE
7	4.22	DEE	Attached deposits, encrustation from 7 o'clock to 5 o'clock, 5% cross-sectional area loss
8	11.11	DER	Settled deposits, coarse, 10% cross-sectional area loss, finish, PATCHY
9	11.11	WL	Water level, 5% of the vertical dimension
10	27.13	JN	Junction at 3 o'clock, diameter: 100mm
11	28.93	DER	Settled deposits, coarse, 20% cross-sectional area loss
12	31.66	JN	Junction at 3 o'clock, diameter: 150mm
13	32.15	JN	Junction at 10 o'clock, diameter: 100mm
14	32.15	DER	Settled deposits, coarse, 10% cross-sectional area loss, start
15	36.75	DER	Settled deposits, coarse, 10% cross-sectional area loss, finish
16	40.53	DER	Settled deposits, coarse, 10% cross-sectional area loss, start
17	46.45	JN	Junction at 3 o'clock, diameter: 100mm
18	54.61	DER	Settled deposits, coarse, 10% cross-sectional area loss, finish
19	54.61	MHF	Finish node type, manhole, reference number: MH07

PLR:	MH08X	Upstream Node:	MH08
Inspection Direction:	Downstream	Downstream Node:	MH09
Inspected Length:	45.06 m	Dia/Height:	450 mm
Total Length:	100.00 m	Material:	Vitrified clay

No.	m+	Code	Observation
1	0.00	MH	Start node type, manhole, reference number: MH08
2	0.00	WL	Water level, 5% of the vertical dimension
3	9.18	FL	Fracture, longitudinal at 12 o'clock
4	17.85	JN	Junction at 9 o'clock, diameter: 100mm
5	34.52	WL	Water level, 20% of the vertical dimension
6	35.91	FL	Fracture, longitudinal at 1 o'clock
7	44.44	DER	Settled deposits, coarse, 45% cross-sectional area loss
8	45.06	SA	Survey abandoned, DUE TO DER

PLR:	MH08X	Upstream Node:	MH08
Inspection Direction:	Upstream	Downstream Node:	MH09
Inspected Length:	6.99 m	Dia/Height:	450 mm
Total Length:	100.00 m	Material:	Vitrified clay

No.	m+	Code	Observation
1	0.00	MH	Start node type, manhole, reference number: MH09
2	0.00	WL	Water level, 5% of the vertical dimension
3	1.20	DER	Settled deposits, coarse, 55% cross-sectional area loss, start
4	3.79	CL	Crack, longitudinal at 12 o'clock
5	6.17	JN	Junction at 3 o'clock, diameter: 150mm
6	6.99	DER	Settled deposits, coarse, 55% cross-sectional area loss, finish
7	6.99	DER	Settled deposits, coarse, 70% cross-sectional area loss
8	6.99	SA	Survey abandoned, LINE CLEANSE REQUIRED

Project Summary

Project Name
2020_12_14 MOTT MCDONALD STAR OLIVE MANCHESTER

Project Number

Project Date
14/12/2020

Pipe Summary

No.	Type	PLR	Upstream Node	Downstream Node	Road	Town	Use	Mat.	Profile	Length
1	SEC	MH01X	MH01	MH02	Bignor Street	Manchester	C	BR	U-Shaped with flat top 450/375mm	206.79 m
2	SEC	MH03X	MH03	MH04	Tamerton Drive	Manchester	C	CO	Circular 300mm	66.51 m
3	SEC	MH05X	MH05	MH04	Tamerton Drive	Manchester	C	CO	Circular 300mm	28.93 m
4	SEC	MH06X	MH06	MH05	Tamerton Drive	Manchester	C	VC	Circular 225mm	22.15 m
5	SEC	MH07X	MH07	MH06	Tamerton Drive	Manchester	C	VC	Circular 225mm	54.61 m
6	SEC	MH08X	MH08	MH09	Haywood Street	Manchester	C	VC	Circular 450mm	100.00 m
Total:										478.98 m

Pipe Levels

No.	PLR	Upstream Node	Upstream C.L.	Upstream I.L.	Upstream I.D.	Downstream Node	Downstream C.L.	Downstream I.L.	Downstream I.D.
1	MH01X	MH01			3.800 m	MH02			3.300 m
2	MH03X	MH03			2.490 m	MH04			2.740 m
3	MH05X	MH05			2.430 m	MH04			2.740 m
4	MH06X	MH06			2.250 m	MH05			2.430 m
5	MH07X	MH07			1.970 m	MH06			2.250 m
6	MH08X	MH08			4.630 m	MH09			4.320 m

Pipe Summary by Profile

Profile	Total Length	No. Pipes
Circular 225mm	22.15 m	
Circular 225mm	54.61 m	
Circular 225mm =	76.76 m	2
Circular 300mm	66.51 m	
Circular 300mm	28.93 m	
Circular 300mm =	95.43 m	2
Circular 450mm	100.00 m	

Project Summary

Project Name 2020_12_14 MOTT MCDONALD STAR OLIVE MANCHESTER	Project Number	Project Date 14/12/2020
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Profile	Total Length	No. Pipes
Circular 450mm =	100.00 m	1
U-Shaped with flat top 450/375mm	206.79 m	
U-Shaped with flat top 450/375mm =	206.79 m	1
Total =	478.98 m	6

Inspection Summary

Pipe No.	Insp. No.	Upstream Node	Downstream Node	Dir.	Operator	Insp. Date	Insp. Time	Str	Ser	Final Observation	Length
1	1	MH01	MH02	DS	Pk	14/12/2020	8:07	4	4	DEX, FOUL	206.79 m
2	1	MH03	MH04	US	Pk	14/12/2020	9:52	1	4	MHF	66.51 m
3	1	MH05	MH04	US	Pk	14/12/2020	10:29	1	4	MHF	28.93 m
4	1	MH06	MH05	DS	Pk	14/12/2020	10:48	1	3	MHF	22.15 m
5	1	MH07	MH06	US	Pk	14/12/2020	11:00	1	4	MHF	54.61 m
6	1	MH08	MH09	DS	Pk	14/12/2020	11:19	3	4	SA, DUE TO DER	45.06 m
6	2	MH08	MH09	US	Pk	14/12/2020	11:34	2	5	SA, LINE CLEANSE REQUIRED	6.99 m
Total:											431.03 m

Inspection Summary by Profile

Profile	Total Length	No. Inspections
Circular 225mm	22.15 m	
Circular 225mm	54.61 m	
Circular 225mm =	76.76 m	2
Circular 300mm	66.51 m	
Circular 300mm	28.93 m	
Circular 300mm =	95.43 m	2
Circular 450mm	45.06 m	
Circular 450mm	6.99 m	
Circular 450mm =	52.06 m	2
U-Shaped with flat top 450/375mm	206.79 m	
U-Shaped with flat top =	206.79 m	1

Project Summary

Project Name 2020_12_14 MOTT MCDONALD STAR OLIVE MANCHESTER	Project Number	Project Date 14/12/2020
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Profile	Total Length	No. Inspections
450/375mm		
Total	= 431.03 m	7

Defect Summary				CCTV Drainage Survey Observation Count																				
				General				Structural Condition								Service Condition								
Sect. No.	Insp. No.	Upstream Node	Downstream Node	Insp. Length (m)	No. Grade 4/5 Obs.	Survey Abandoned	Camera Under Water	Cracks	Fractures	Broken	Deformed	Collapsed	Holes	Surface Damage	Displaced Joints	Open Joints	Roots	Infiltration	Encrustation	Silt	Grease	Obstruction	Water Level	Line Deviates
1	1	MH01	MH02	206.8	1			1	1								4	1	1				1	
2	1	MH03	MH04	66.5																			2	
3	1	MH05	MH04	28.9															2				1	
4	1	MH06	MH05	22.1															1				1	
5	1	MH07	MH06	54.6															2				2	
6	1	MH08	MH09	45.1		1			2														2	
6	2	MH08	MH09	7.0		1		1															1	
Total:				431.0	1	2		2	3								4	1	6				10	

Section Inspection - 14/12/2020 - MH01X

Item No. 1	Insp. No. 1	Date 14/12/20	Time 8:07	Client's Job Ref PK00001732	Weather Rain	Pre Cleaned No	PLR MH01X
Operator PK		Vehicle SC15NYG		Camera Ipek Ex	Preset Length 0.90 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Downstream	Upstream Node:	MH01
Road:	Bignor Street	Inspected Length:	206.79 m	Upstream Pipe Depth:	3.800 m
Location:	Road	Total Length:	206.79 m	Downstream Node:	MH02
Surface Type:	Asphalt Highway	Joint Length:		Downstream Pipe Depth:	3.300 m
Use:	Combined		Pipe Shape:	U-Shaped with flat top	
Type of Pipe:	Gravity drain/sewer		Dia/Height:	450 mm	Width: 375 mm
Flow Control:	No flow control		Material:	Brick	
Year Constructed:	Not Specified		Lining Type:	No Lining	
Inspection Purpose:	Sample condition survey		Lining Material:	No Lining	
Comments:	None				
Recommendations:	Poss Repair (incl Patch Line) or dig				

**WEB PROJECT**
CLICK TO OPEN THIS SECTION



Scale: 1:621	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: 3.80 m						
MH01						
	0.00	MH	Start node type, manhole, reference number: MH01	00:00:02		
	0.00	WL	Water level, 10% of the vertical dimension	00:00:03		
	4.06	DEX	Settled deposits, other, 10% cross-sectional area loss: FOUL	00:00:29		3
	6.27	CN	Connection other than junction at 9 o'clock, diameter: 225mm	00:00:45		
	8.19	S01 DEX	Settled deposits, other, 10% cross-sectional area loss, start: FOUL	00:01:18		
	17.04	JN	Junction at 3 o'clock, diameter: 150mm: LIVE	00:01:54		
	18.43	JN	Junction at 9 o'clock, diameter: 150mm	00:02:20		
	19.22	CN	Connection other than junction at 9 o'clock, diameter: 225mm	00:02:36		
	25.61	REM	General remark: OLD SHAFT	00:03:17		
	29.45	CN	Connection other than junction at 9 o'clock, diameter: 150mm	00:03:45		
	35.49	DB	Displaced bricks from 7 o'clock to 8 o'clock	00:04:27		4
	39.33	DB	Displaced bricks from 4 o'clock to 5 o'clock	00:04:53		4
	41.83	DB	Displaced bricks from 7 o'clock to 8 o'clock	00:05:13		4
	43.20	DB	Displaced bricks from 4 o'clock to 5 o'clock	00:05:24		4
	44.33	MB	Missing bricks from 4 o'clock to 5 o'clock	00:05:34		4

Section Inspection - 14/12/2020 - MH01X

Item No.	Insp. No.	Date	Time	Client's Job Ref	Weather	Pre Cleaned	PLR
1	1	14/12/20	8:07	PK00001732	Rain	No	MH01X
Operator		Vehicle		Camera	Preset Length	Legal Status	Alternative ID
PK		SC15NYG		Ipek Ex	0.90 m	Public Sewer	Not Specified

Scale:	1:621	Position [m]	Code	Observation	MPEG	Photo	Grade
		46.79	SC	Pipe size changes, new size(s), 375mm high	00:05:54		
		46.79	MCVC	Pipe material changes to vitrified clay at this point	00:05:58		
		48.88	JN	Junction at 9 o'clock, diameter: 225mm	00:06:07		
		52.43	JN	Junction at 2 o'clock, diameter: 150mm	00:06:20		
		62.70	MCCI	Pipe material changes to cast iron at this point	00:07:10		
		65.40	MCVC	Pipe material changes to vitrified clay at this point	00:07:33		
		65.47	JN	Junction at 3 o'clock, diameter: 225mm: CAPPED	00:07:35		
		75.63	JN	Junction at 9 o'clock, diameter: 100mm	00:08:12		
		81.25	JN	Junction at 2 o'clock, diameter: 150mm	00:08:44		
		104.88	JN	Junction at 3 o'clock, diameter: 150mm	00:10:31		
		115.55	JN	Junction at 9 o'clock, diameter: 100mm	00:11:23		
		128.48	JN	Junction at 3 o'clock, diameter: 150mm	00:12:23		
		129.22	JN	Junction at 3 o'clock, diameter: 150mm	00:12:27		
		132.70	RFJ	Roots, fine at joint	00:12:44		
		133.30	RFJ	Roots, fine at joint	00:12:48		
		134.70	JN	Junction at 9 o'clock, diameter: 100mm	00:12:56		
		153.06	JN	Junction at 9 o'clock, diameter: 150mm	00:14:43		
		153.76	JN	Junction at 9 o'clock, diameter: 100mm	00:14:49		
		156.73	JN	Junction at 9 o'clock, diameter: 150mm	00:15:08		
		156.73	RF	Roots, fine	00:15:09		2

Section Inspection - 14/12/2020 - MH01X

Item No.	Insp. No.	Date	Time	Client's Job Ref	Weather	Pre Cleaned	PLR
1	1	14/12/20	8:07	PK00001732	Rain	No	MH01X
Operator		Vehicle		Camera	Preset Length	Legal Status	Alternative ID
PK		SC15NYG		Ipek Ex	0.90 m	Public Sewer	Not Specified

Scale:	1:621	Position [m]	Code	Observation	MPEG	Photo	Grade
		159.74	JN	Junction at 3 o'clock, diameter: 150mm	00:15:28		
		176.03	JN	Junction at 9 o'clock, diameter: 150mm	00:17:02		
		176.58	CCJ	Crack, circumferential at joint from 7 o'clock to 12 o'clock	00:17:12		
		183.57	RFJ	Roots, fine at joint	00:17:55		
		184.42	DEX	Settled deposits, other, 20% cross-sectional area loss: FOUL	00:18:02		4
		185.76	CN	Connection other than junction at 9 o'clock, diameter: 100mm	00:19:00		
		185.76	FL	Fracture, longitudinal at 10 o'clock	00:18:47		4 / 2
		195.60	IDJ	Infiltration, dripping at joint at 10 o'clock	00:20:03		
		197.91	DEEJ	Attached deposits, encrustation at joint from 8 o'clock to 9 o'clock, 5% cross-sectional area loss	00:20:19		
		199.65	JN	Junction at 3 o'clock, diameter: 150mm	00:20:32		
		202.73	JN	Junction at 3 o'clock, diameter: 150mm	00:20:53		
		206.79	MHF	Finish node type, manhole, reference number: MH02	00:21:28		
		206.79	F01	DEX Settled deposits, other, 10% cross-sectional area loss, finish: FOUL	00:21:27		3

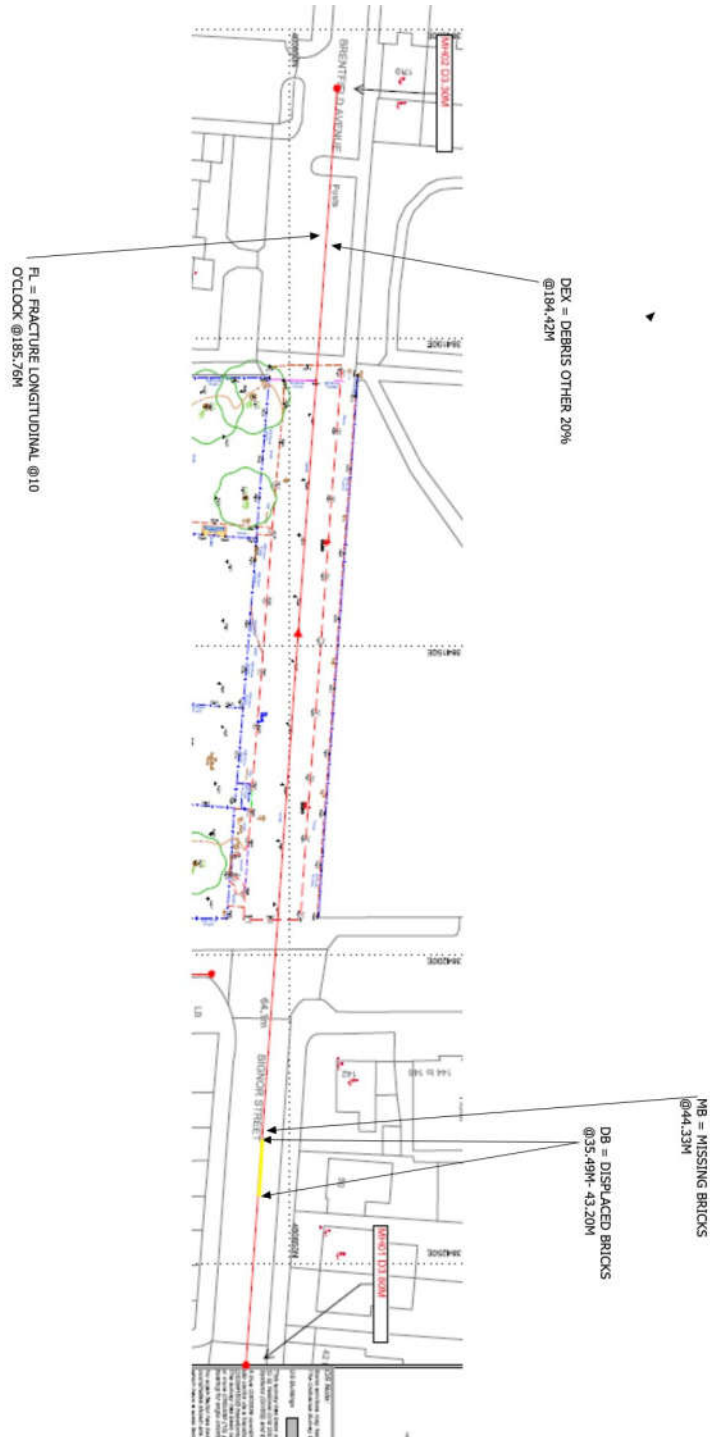
Depth: 3.30 m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
6	120.0	2.7	560.0	4.0	5	7.0	2.0	407.0	4.0

Section Inspection - 14/12/2020 - MH01X

Item No.	Insp. No.	Date	Time	Client's Job Ref	Weather	Pre Cleaned	PLR
1	1	14/12/20	8:07	PK00001732	Rain	No	MH01X
Operator PK		Vehicle SC15NYG		Camera Ipek Ex	Preset Length 0.90 m	Legal Status Public Sewer	Alternative ID Not Specified

Section Drawing MH01X, Page MH01X



Section Inspection - 14/12/2020 - MH03X

Item No. 2	Insp. No. 2	Date 14/12/20	Time 9:52	Client's Job Ref PK00001733	Weather No Rain Or Snow	Pre Cleaned No	PLR MH03X
Operator PK		Vehicle SC15NYG		Camera Ipek Ex	Preset Length 0.80 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Upstream	Upstream Node:	MH03
Road:	Tamerton Drive	Inspected Length:	66.51 m	Upstream Pipe Depth:	2.490 m
Location:	Road	Total Length:	66.51 m	Downstream Node:	MH04
Surface Type:	Asphalt Highway	Joint Length:	1.00 m	Downstream Pipe Depth:	2.740 m
Use:	Combined	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	300 mm		
Flow Control:	No flow control	Material:	Concrete		
Year Constructed:	Not Specified	Lining Type:	No Lining		
Inspection Purpose:	Sample condition survey	Lining Material:	No Lining		
Comments:	None				
Recommendations:	HPWJ due to silt/debris > 20%				



Scale: 1:574	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: 2.74 m						
MH04						
	0.00	MH	Start node type, manhole, reference number: MH04	00:00:01		
	0.00	WL	Water level, 10% of the vertical dimension	00:00:03		
	0.80	S01	DER Settled deposits, coarse, 10% cross-sectional area loss, start: PATCHY	00:00:09		
	4.66	WL	Water level, 5% of the vertical dimension	00:00:25		
	4.66	F01	DER Settled deposits, coarse, 10% cross-sectional area loss, finish: PATCHY	00:00:26		3
	9.26	CN	Connection other than junction at 12 o'clock, diameter: 100mm: LIVE	00:00:43		
	26.44	DER	Settled deposits, coarse, 5% cross-sectional area loss	00:01:29		3
	29.39	IRJ	Infiltration, running at joint from 10 o'clock to 2 o'clock	00:01:42		
	42.05	S02	DER Settled deposits, coarse, 5% cross-sectional area loss, start: PATCHY	00:02:17		
	49.57	CN	Connection other than junction at 12 o'clock, diameter: 100mm	00:02:40		
	54.03	F02	DER Settled deposits, coarse, 5% cross-sectional area loss, finish: PATCHY	00:02:56		3
	54.03	DER	Settled deposits, coarse, 20% cross-sectional area loss	00:02:57	MH03X_8f b8cb07-28 51-4d4c-8	4
	55.63	DER	Settled deposits, coarse, 10% cross-sectional area loss	00:03:11		3
	57.07	CN	Connection other than junction at 12 o'clock, diameter: 100mm	00:03:19		
MH03						
Depth: 2.49 m						
	66.51	MHF	Finish node type, manhole, reference number: MH03	00:03:57		

Construction Features

Structural Defects

Miscellaneous Features

Service & Operational Observations

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	5	7.0	0.7	41.0	4.0

Section Pictures - 14/12/2020 - MH03X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
2	Upstream	MH03X	PK00001733	14033



MH03X_8fb8cb07-2851-4d4c-84e6-1c39e1ff0147_20201214_095852_861.jpg, 00:02:57, 54.03 m
Settled deposits, coarse, 20% cross-sectional area loss

Section Inspection - 14/12/2020 - MH05X

Item No. 3	Insp. No. 3	Date 14/12/20	Time 10:29	Client's Job Ref PK00001734	Weather No Rain Or Snow	Pre Cleaned No	PLR MH05X
Operator PK		Vehicle SC15NYG		Camera Ipek Ex	Preset Length 0.80 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Upstream	Upstream Node:	MH05
Road:	Tamerton Drive	Inspected Length:	28.93 m	Upstream Pipe Depth:	2.430 m
Location:	Road	Total Length:	28.93 m	Downstream Node:	MH04
Surface Type:	Asphalt Highway	Joint Length:	1.00 m	Downstream Pipe Depth:	2.740 m
Use:	Combined	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	300 mm		
Flow Control:	No flow control	Material:	Concrete		
Year Constructed:	Not Specified	Lining Type:	No Lining		
Inspection Purpose:	Sample condition survey	Lining Material:	No Lining		
Comments:	None				
Recommendations:	HPWJ due to silt/debris > 20%				



Scale: 1:250	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: 2.74 m MH04 0.00 0.00 8.27 8.27 8.27 9.93 26.78 26.78 28.42 28.93 28.93 MH05 Depth: 2.43 m						
	0.00	MH	Start node type, manhole, reference number: MH04	00:00:01		
	0.00	WL	Water level, 5% of the vertical dimension	00:00:02		
	8.27	DER	Settled deposits, coarse, 5% cross-sectional area loss	00:00:34		3
	8.27	CN	Connection other than junction at 12 o'clock, diameter: 100mm: LIVE	00:00:31		
	8.27	DEEJ	Attached deposits, encrustation at joint from 7 o'clock to 5 o'clock, 5% cross-sectional area loss	00:00:32		3
	9.93	S01 DER	Settled deposits, coarse, 10% cross-sectional area loss, start: PATCHY	00:00:57		
	26.78	CN	Connection other than junction at 2 o'clock, diameter: 100mm	00:02:33		
	26.78	DEE	Attached deposits, encrustation from 2 o'clock to 5 o'clock, 10% cross-sectional area loss	00:02:35		3
	28.42	DER	Settled deposits, coarse, 30% cross-sectional area loss	00:02:43	MH05X_2 e726287-9 6e5-4341-	4
	28.93	F01 DER	Settled deposits, coarse, 10% cross-sectional area loss, finish: PATCHY	00:02:55		3
	28.93	MHF	Finish node type, manhole, reference number: MH05	00:02:59		

Construction Features

Structural Defects

Miscellaneous Features

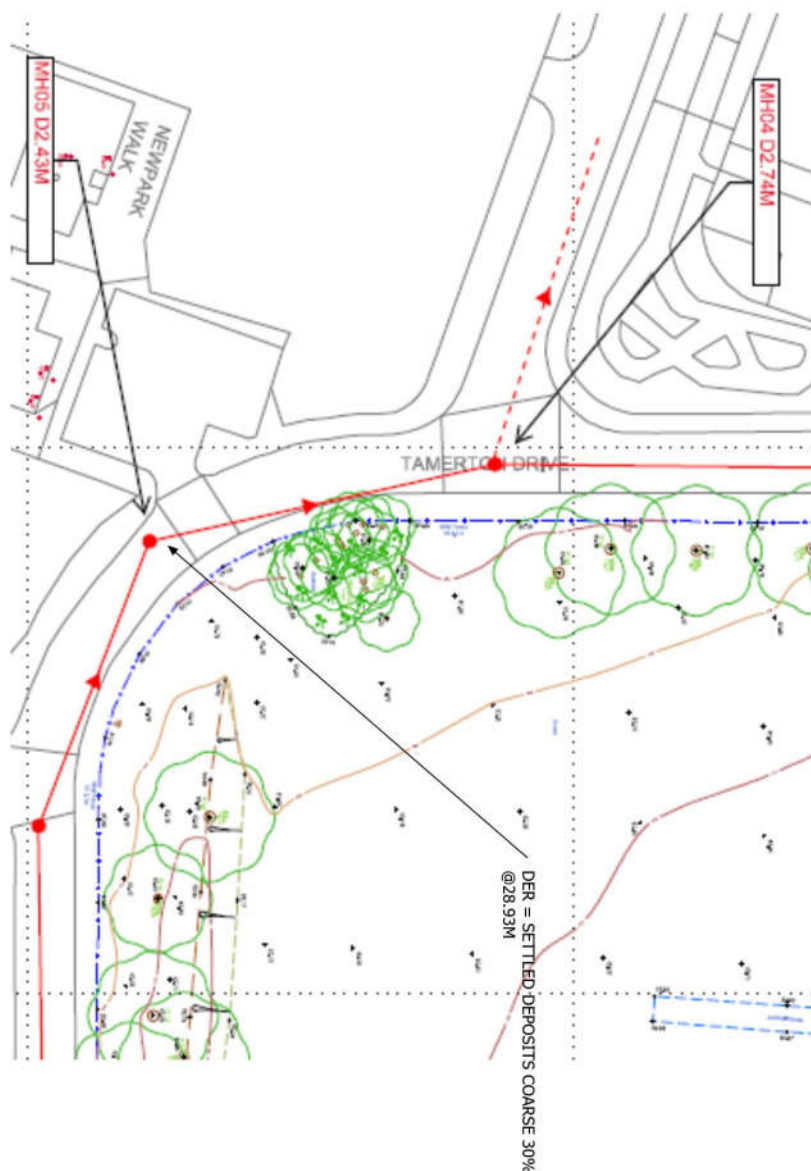
Service & Operational Observations

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	5	7.0	1.8	51.0	4.0

Section Inspection - 14/12/2020 - MH05X

Item No.	Insp. No.	Date	Time	Client's Job Ref	Weather	Pre Cleaned	PLR
3	3	14/12/20	10:29	PK00001734	No Rain Or Snow	No	MH05X
Operator		Vehicle		Camera	Preset Length	Legal Status	Alternative ID
PK		SC15NYG		Ipek Ex	0.80 m	Public Sewer	Not Specified

Section Drawing MH05X, Page MH05X



Section Pictures - 14/12/2020 - MH05X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
3	Upstream	MH05X	PK00001734	14033



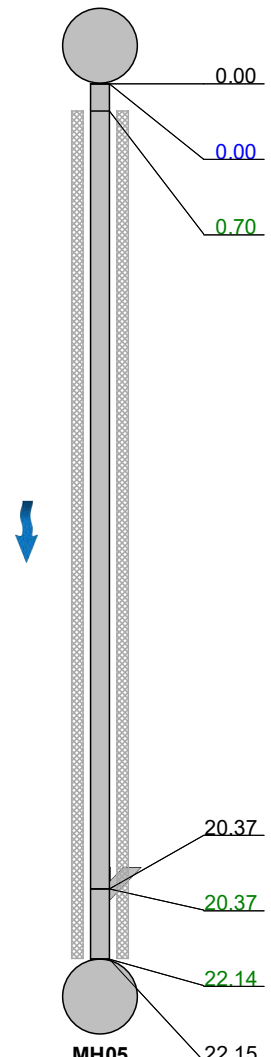
MH05X_2e726287-96e5-4341-aad3-81de6327b705_20201214_103749_426.jpg, 00:02:43, 28.42 m
Settled deposits, coarse, 30% cross-sectional area loss

Section Inspection - 14/12/2020 - MH06X

Item No. 4	Insp. No. 4	Date 14/12/20	Time 10:48	Client's Job Ref PK00001735	Weather No Rain Or Snow	Pre Cleaned No	PLR MH06X
Operator PK		Vehicle SC15NYG		Camera Ipek Ex	Preset Length 0.70 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Downstream	Upstream Node:	MH06
Road:	Tamerton Drive	Inspected Length:	22.15 m	Upstream Pipe Depth:	2.250 m
Location:	Road	Total Length:	22.15 m	Downstream Node:	MH05
Surface Type:	Asphalt Highway	Joint Length:	1.00 m	Downstream Pipe Depth:	2.430 m
Use:	Combined	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	225 mm		
Flow Control:	No flow control	Material:	Vitrified clay		
Year Constructed:	Not Specified	Lining Type:	No Lining		
Inspection Purpose:	Sample condition survey	Lining Material:	No Lining		
Comments:	None				
Recommendations:	None				



Scale: 1:191	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: 2.25 m MH06 						
0.00	MH	Start node type, manhole, reference number: MH06	00:00:01			
0.00	WL	Water level, 10% of the vertical dimension	00:00:02			
0.70 S01	DER	Settled deposits, coarse, 10% cross-sectional area loss, start: PATCHY	00:00:09			
20.37	CN	Connection other than junction at 11 o'clock, diameter: 100mm: LIVE	00:05:17			
20.37	DEEJ	Attached deposits, encrustation at joint from 9 o'clock to 3 o'clock, 20% cross-sectional area loss	00:05:18	MH06X_a a65ac50-3 b82-4696-	3	
22.14 F01	DER	Settled deposits, coarse, 10% cross-sectional area loss, finish: PATCHY	00:05:41			3
22.15	MHF	Finish node type, manhole, reference number: MH05	00:05:43			
Depth: 2.43 m MH05						

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	4.0	2.1	46.0	3.0

Section Pictures - 14/12/2020 - MH06X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
4	Downstream	MH06X	PK00001735	14033



MH06X_aa65ac50-3b82-4696-84e9-a811ffd4df52_20201214_105730_563.jpg, 00:05:18, 20.37 m

Attached deposits, encrustation at joint from 9 o'clock to 3 o'clock, 20% cross-sectional area loss

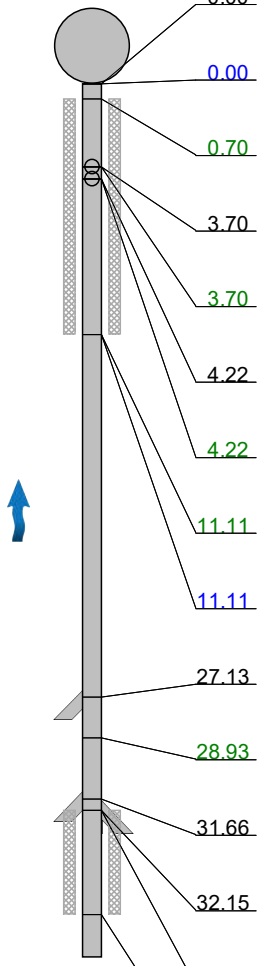
Section Inspection - 14/12/2020 - MH07X

Item No. 5	Insp. No. 5	Date 14/12/20	Time 11:00	Client's Job Ref PK00001736	Weather No Rain Or Snow	Pre Cleaned No	PLR MH07X
Operator PK		Vehicle SC15NYG		Camera Ipek Ex	Preset Length 0.70 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Upstream	Upstream Node:	MH07
Road:	Tamerton Drive	Inspected Length:	54.61 m	Upstream Pipe Depth:	1.970 m
Location:	Road	Total Length:	54.61 m	Downstream Node:	MH06
Surface Type:	Asphalt Highway	Joint Length:	1.00 m	Downstream Pipe Depth:	2.250 m
Use:	Combined		Pipe Shape:	Circular	
Type of Pipe:	Gravity drain/sewer		Dia/Height:	225 mm	
Flow Control:	No flow control		Material:	Vitrified clay	
Year Constructed:	Not Specified		Lining Type:	No Lining	
Inspection Purpose:	Sample condition survey		Lining Material:	No Lining	
Comments:	None				
Recommendations:	HPWJ due to silt/debris > 20%				

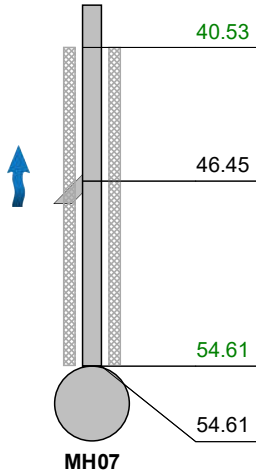
**WEB PROJECT**
CLICK TO OPEN THIS SECTION



Scale: 1:334	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: 2.25 m						
	0.00	MH	Start node type, manhole, reference number: MH06	00:00:01		
	0.00	WL	Water level, 10% of the vertical dimension	00:00:02		
	0.70	S01	DER Settled deposits, coarse, 10% cross-sectional area loss, start: PATCHY	00:00:06		
	3.70	CN	Connection other than junction at 12 o'clock, diameter: 100mm	00:00:35		
	3.70	DEE	Attached deposits, encrustation from 7 o'clock to 5 o'clock, 5% cross-sectional area loss	00:00:36		3
	4.22	CN	Connection other than junction at 12 o'clock, diameter: 100mm: LIVE	00:00:40		
	4.22	DEE	Attached deposits, encrustation from 7 o'clock to 5 o'clock, 5% cross-sectional area loss	00:00:41		3
	11.11	F01	DER Settled deposits, coarse, 10% cross-sectional area loss, finish: PATCHY	00:01:04		3
	11.11	WL	Water level, 5% of the vertical dimension	00:01:07		
	27.13	JN	Junction at 3 o'clock, diameter: 100mm	00:01:59		
	28.93	DER	Settled deposits, coarse, 20% cross-sectional area loss	00:02:07	MH07X_Of fc96cc-13e b-46eb-ad	4
	31.66	JN	Junction at 3 o'clock, diameter: 150mm	00:02:32		
	32.15	JN	Junction at 10 o'clock, diameter: 100mm	00:02:37		
	32.15	S02	DER Settled deposits, coarse, 10% cross-sectional area loss, start	00:02:38		
	36.75	F02	DER Settled deposits, coarse, 10% cross-sectional area loss, finish	00:02:56		3

Section Inspection - 14/12/2020 - MH07X

Item No.	Insp. No.	Date	Time	Client's Job Ref	Weather	Pre Cleaned	PLR
5	5	14/12/20	11:00	PK00001736	No Rain Or Snow	No	MH07X
Operator		Vehicle		Camera	Preset Length	Legal Status	Alternative ID
PK		SC15NYG		Ipek Ex	0.70 m	Public Sewer	Not Specified

Scale:	1:334	Position [m]	Code	Observation	MPEG	Photo	Grade
		40.53	S03	DER	Settled deposits, coarse, 10% cross-sectional area loss, start	00:03:10	
		46.45		JN	Junction at 3 o'clock, diameter: 100mm	00:03:42	
		54.61	F03	DER	Settled deposits, coarse, 10% cross-sectional area loss, finish	00:04:17	3
		54.61		MHF	Finish node type, manhole, reference number: MH07	00:04:19	
Depth: 1.97 m							

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	6	5.0	1.3	71.0	4.0

Section Pictures - 14/12/2020 - MH07X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
5	Upstream	MH07X	PK00001736	14033



MH07X_Off96cc-13eb-46eb-ad70-f0f6b7bcd78f_20201214_1
10607_961.jpg, 00:02:07, 28.93 m
Settled deposits, coarse, 20% cross-sectional area loss

Section Inspection - 14/12/2020 - MH08X

Item No. 6	Insp. No. 6	Date 14/12/20	Time 11:19	Client's Job Ref PK00001737	Weather No Rain Or Snow	Pre Cleaned No	PLR MH08X
Operator PK		Vehicle SC15NYG		Camera Ipek Ex	Preset Length 1.20 m	Legal Status Public Sewer	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Downstream	Upstream Node:	MH08
Road:	Haywood Street	Inspected Length:	45.06 m	Upstream Pipe Depth:	4.630 m
Location:	Road	Total Length:	100.00 m	Downstream Node:	MH09
Surface Type:	Asphalt Highway	Joint Length:	1.00 m	Downstream Pipe Depth:	4.320 m
Use:	Combined	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	450 mm		
Flow Control:	No flow control	Material:	Vitrified clay		
Year Constructed:	Not Specified	Lining Type:	No Lining		
Inspection Purpose:	Sample condition survey	Lining Material:	No Lining		
Comments:	None				
Recommendations:	HPWJ due to silt/debris > 20%				



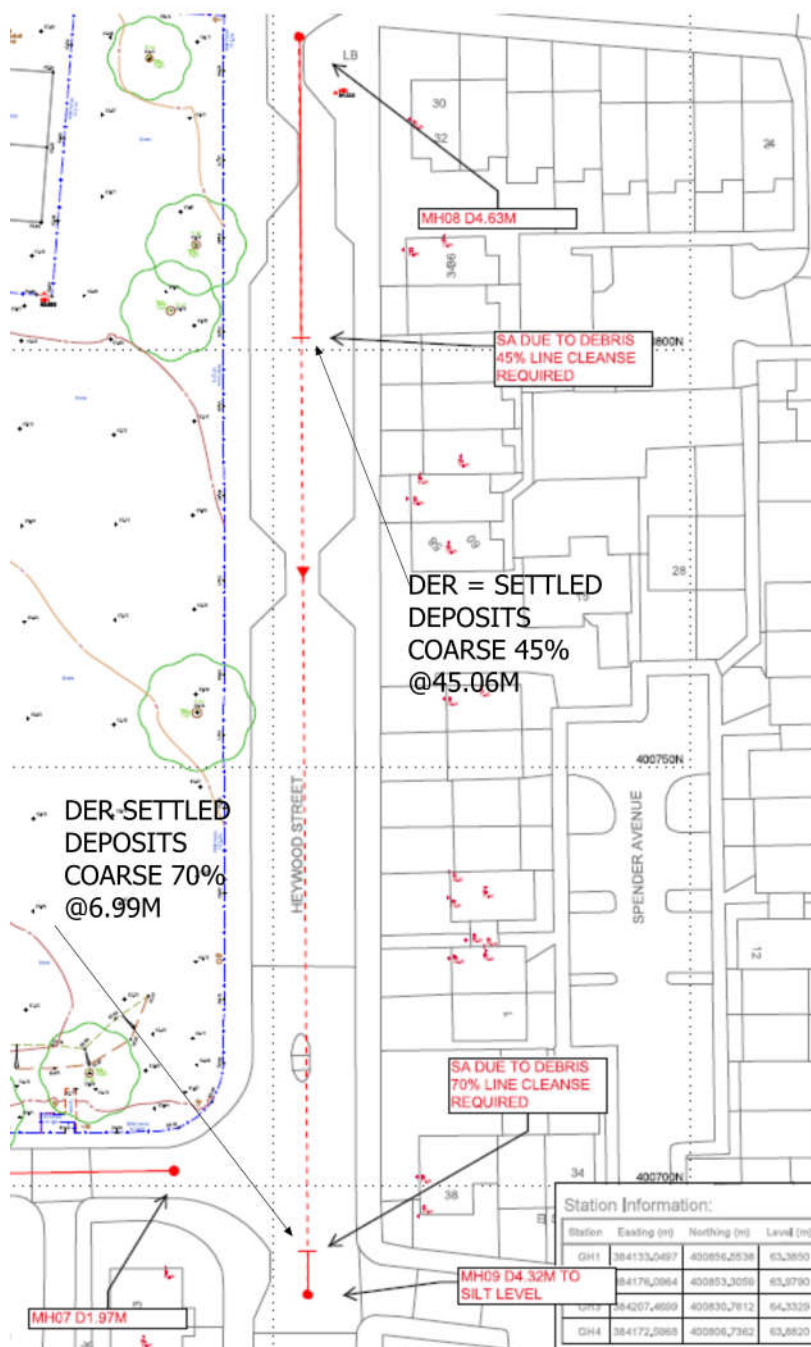
Scale: 1:863	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: 4.63 m MH08						
	0.00	MH	Start node type, manhole, reference number: MH08	00:00:01		
	0.00	WL	Water level, 5% of the vertical dimension	00:00:03		
	9.18	FL	Fracture, longitudinal at 12 o'clock	00:00:31		3 / 2
	17.85	JN	Junction at 9 o'clock, diameter: 100mm	00:00:52		
	34.52	WL	Water level, 20% of the vertical dimension	00:01:30		
	35.91	FL	Fracture, longitudinal at 1 o'clock	00:01:36		3 / 2
	44.44	DER	Settled deposits, coarse, 45% cross-sectional area loss	00:02:12	MH08X_0 7010bee-7 af6-42cb-9	4
	45.06	SA	Survey abandoned: DUE TO DER	00:02:40		
	100.00		End of pipe			
MH09 Depth: 4.32 m						

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
2	40.0	1.8	80.0	3.0	3	5.0	0.2	7.0	4.0

Section Inspection - 14/12/2020 - MH08X

Item No. 6	Insp. No. 6	Date 14/12/20	Time 11:19	Client's Job Ref PK00001737	Weather No Rain Or Snow	Pre Cleaned No	PLR MH08X
Operator PK		Vehicle SC15NYG		Camera Ipek Ex	Preset Length 1.20 m	Legal Status Public Sewer	Alternative ID Not Specified

Section Drawing MH08X, Page MH08X



Section Pictures - 14/12/2020 - MH08X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
6	Downstream	MH08X	PK00001737	14033

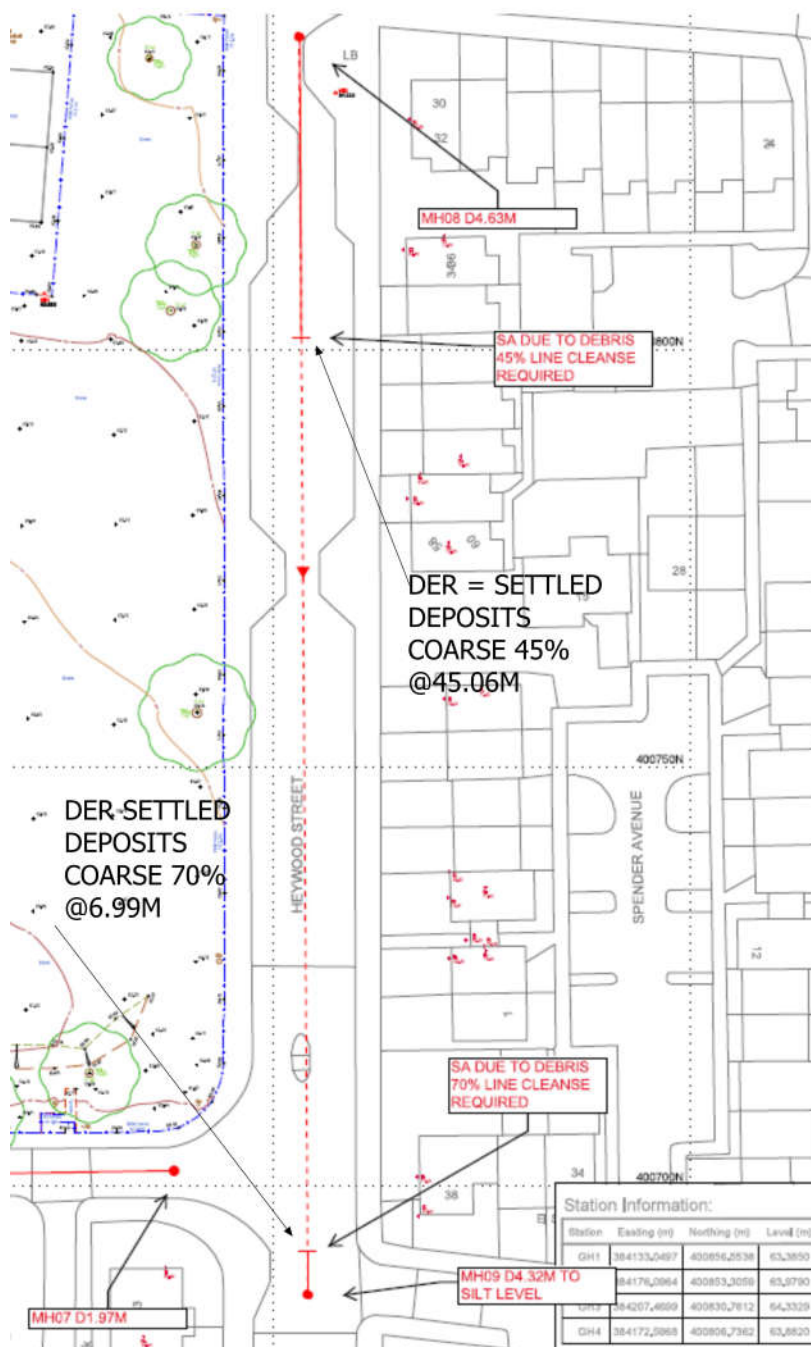


MH08X_07010bee-7af6-42cb-9d4a-a93d147e7c2d_20201214
_112544_470.jpg, 00:02:12, 44.44 m
Settled deposits, coarse, 45% cross-sectional area loss

Section Inspection - 14/12/2020 - MH08X

Item No. 6	Insp. No. 2	Date 14/12/20	Time 11:34	Client's Job Ref PK00001738	Weather No Rain Or Snow	Pre Cleaned No	PLR MH08X
Operator PK		Vehicle SC15NYG		Camera Ipek Ex	Preset Length 1.20 m	Legal Status Public Sewer	Alternative ID Not Specified

Section Drawing MH08X, Page MH08X

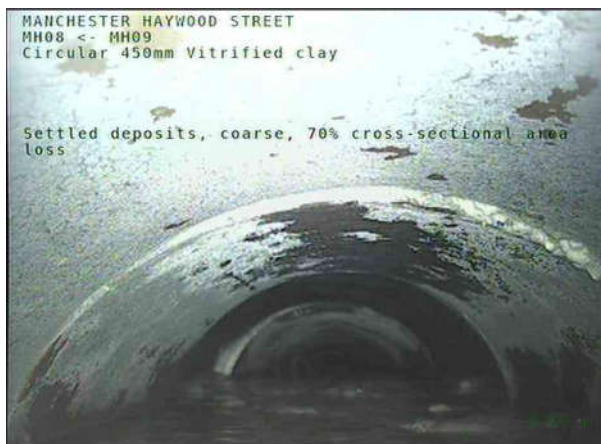


Section Pictures - 14/12/2020 - MH08X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
6	Upstream	MH08X	PK00001738	14033



MH08X_90980464-f189-4a2b-930c-d57861c437eb_20201214_113648_280.jpg, 00:00:09, 1.20 m
Settled deposits, coarse, 55% cross-sectional area loss, start



MH08X_3b97c516-4ae3-4078-8b8f-75b6a98984a8_20201214_113811_753.jpg, 00:01:36, 6.99 m
Settled deposits, coarse, 70% cross-sectional area loss

Appendix D –Catchments Plan.

EXISTING CATCHMENTS

PROPOSED CATCHMENTS



P02	05.01.23	ISSUED FOR PLANNING	CD	DS	DS
P01	20.12.22	ISSUED FOR PLANNING	CD	DS	DS
Rev	Date	Description	By	Check	App.

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Client	CONLON CONSTRUCTION
Project	OLIVE SCHOOL, CHEETHAM HILL, MANCHESTER
Office	ALTRINCHAM
Discipline	CIVIL AND STRUCTURAL
Title	CATCHMENTS PLAN
Scale @ A1	1:250
Status	PRELIMINARY



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Job Number	Originator	Building/Zone	Level
1/2529	CCL	OPS	00
Type	Discipline	Drawing No.	Revision
DR	C	002	P02

Appendix E – Flood Maps for Planning

Flood map for planning

Your reference
1-21529

Location (easting/northing)
384150/400783

Created
16 Dec 2022 9:08

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

1-21529

Location (easting/northing)

384150/400783

Scale

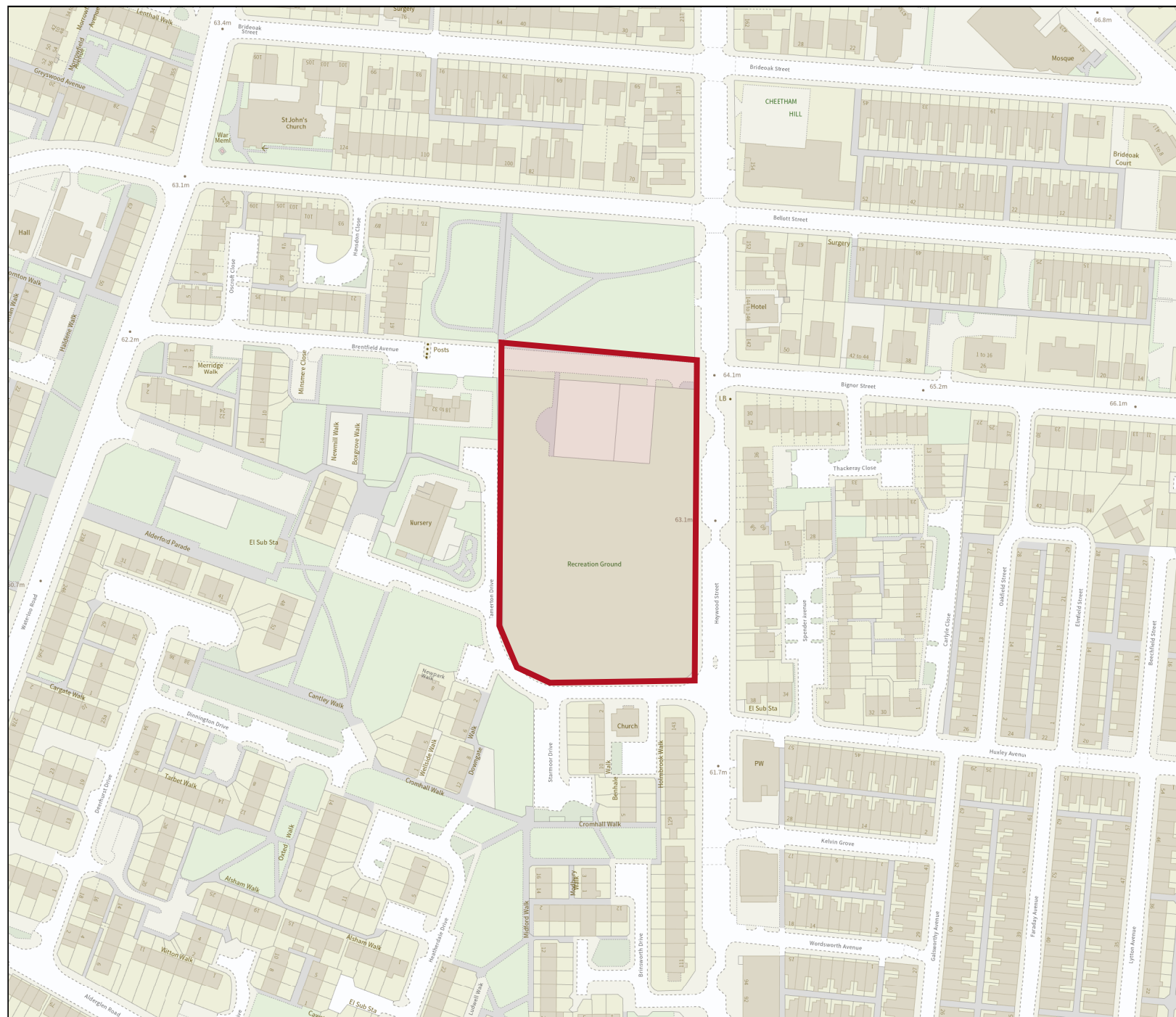
1:2500

Created

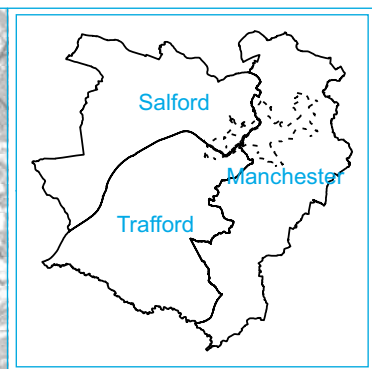
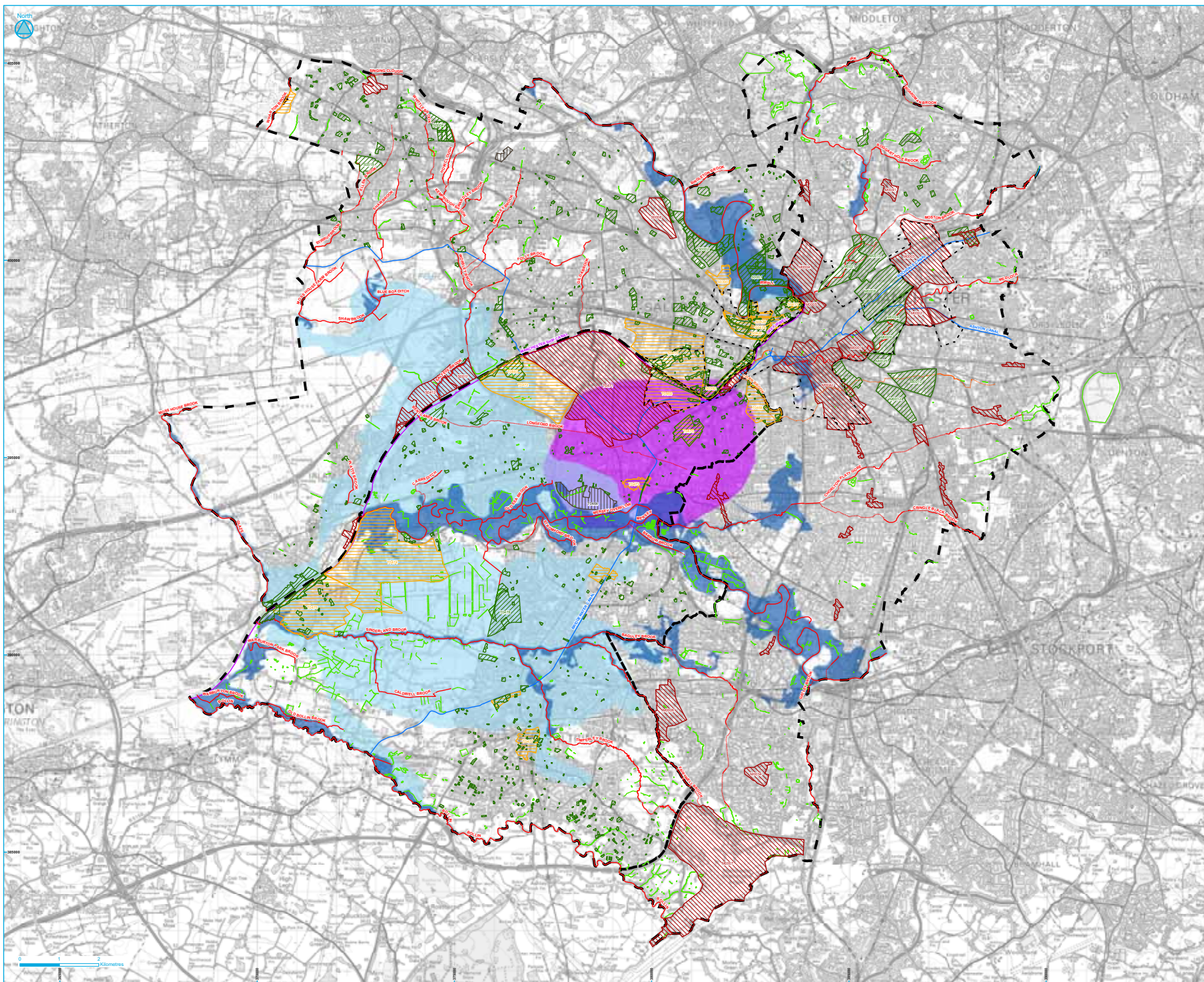
16 Dec 2022 9:08

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

0 20 40 60m



Appendix F – MCC Groundwater Flood Map.



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

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

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

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

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



www.jbaconsulting.co.uk
t 01925 570876
f 01645 862772
e info@jbaconsulting.co.uk

Bank Quay House
Salford Quay
Warrington
WA1 1NN
United Kingdom

Other offices at Atherton, Doncaster, Edinburgh, Haywards Heath, Limerick, Newcastle upon Tyne, Newport, Northampton, Solihull, Slough, Telford & Walsingham



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

Groundwater Flooding

Drawn by: J. Cheatham	Date: 08/03/2011	This map is based upon Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of the Map's Stationery Office. Crown Copyright. See Ordnance Survey's website for details of its copyright and other information. Licence number: 1000100001
Checked by: J. Dimelow	Date: 01/02/2011	
Approved by: J. Cooper	Date: 01/02/2011	
File Name: ArcView\Mapping\level1\MS1_GroundwaterFlooding_v1.3.mxd		
Drawing Number: GW_2.1	Status: FINAL	Scale: 1:45,000

Appendix G – UU and LLFA Correspondence.

Carl Dawson

From: wastewaterdeveloperservices@uuplc.co.uk
Sent: 14 December 2022 11:37
To: Carl Dawson
Subject: RE: Pre Development Enquiry - Olive School, Cheetham Hill - UU Ref. 03182100

Good morning. Carl

BIGNOR STREET PARK, HEYWOOD STREET, CHEETHAM HILL, MANCHESTER, M8 0NZ
LOCATION: SD 84165 00794 (E384165, N400794)
UU ref: 03182100

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 to the 375mm diameter public foul water/combined sewer located to the north of your proposed development.

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

Surface Water

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

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

This is outlined as follows, in order of priority:

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

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

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

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

Infiltration

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

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 highway drain 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 450mm diameter public combined sewer within Heywood Street located to the east of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5 l/s for any storm event. Please note the given discharge rate is based on the full site area as the specifics of the area being developed are not yet clear. If there are significant areas of the site that will not be developed, the discharge rate should be reduced accordingly.

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

Levels

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

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,



United Utilities
Water for the North West

Josephine Wong
Wastewater Developer Engineer
Developer Services & Metering
Customer Services
M: 07880308880 (from 7am to 1pm)
[unitedutilities.com](https://www.unitedutilities.com)

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Coronavirus

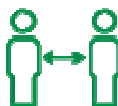
Prevent the spread



Wash your hands



Disinfect common surfaces



Practise social distancing



FEVER + COUGH

Stay home if you have symptoms

[Click for our message to customers](#)

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

From: Carl Dawson [carl.dawson@clancy.co.uk]

Sent: 30/11/2022 12:53

To: wastewaterdeveloperservices@uuplc.co.uk

Cc: chris.acton@clancy.co.uk

Subject: [CCL: 1-21529] Pre Development Enquiry - Olive School, Cheetham Hill.

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

Hi.

Please find attached PDE for the above scheme and supporting information.

The site is currently recreational, including sports courts and grassed areas, with an existing road through the site to the north. The site boundary is 1.31ha.

We consider the site to be a greenfield site. It is proposed to build a new school, MUGA and associated parking/play areas.

It has been shown that the ground conditions consist of significant depth of made ground on clay, therefore we considered it unsuitable for infiltration.

There are no watercourses or surface water sewers within the vicinity of the site, therefore it is proposed to discharge to public combined sewer.

The surface water discharge rate will be limited to 5 l/s for all storms up to 1 in 100 plus an allowance for climate change. Preferred location to the northern public sewer or the public sewer in Heywood Street (see attached).

It is proposed that foul flows will be discharge to the public sewer at an unrestricted rate. Rate TBC.

If you require any further information, please let me know.

Kind regards
Carl Dawson

Carl Dawson

Senior Civil Engineer

Dunham Court, 2 Dunham Road, Altrincham, Cheshire, WA14 4NX.

carl.dawson@clancy.co.uk

Tel: 0161 613 6000

www.clancy.co.uk

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Carl Dawson

From: Carl Dawson
Sent: 30 November 2022 12:58
To: Flood Risk Management
Cc: Chris Acton
Subject: [CCL: 1-21529] Pre Development Enquiry - Olive School, Cheetham Hill.
Attachments: Wastewater PDE - Olive School 30.11.2022.pdf; SITE LOCATION PLAN.pdf; 444396-03-11-2022-01-13-12_CCL EDIT.pdf; ICP SUDS - Full Site.pdf

Categories: Scanned by Gekko

Hi.

Please find attached PDE for the above scheme and supporting information submitted to United Utilities.

The site is currently recreational, including sports courts and grassed areas, with an existing road through the site to the north. The site boundary is 1.31ha.

We consider the site to be a greenfield site. It is proposed to build a new school, MUGA and associated parking/play areas.

It has been shown that the ground conditions consist of significant depth of made ground on clay, therefore we considered it unsuitable for infiltration.

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The surface water discharge rate will be limited to 5 l/s for all storms up to 1 in 100 plus an allowance for climate change. Preferred location to the northern public sewer or the public sewer in Heywood Street (see attached).

It is proposed that foul flows will be discharge to the public sewer at an unrestricted rate. Rate TBC.

Please review and advise if you agree with the above. If you require any further information, please let me know.

Kind regards
Carl Dawson

Appendix H – Hydraulic Calculations.

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.136	5.00	63.600	1200	384174.187	400842.975	1.500
S2	0.070	5.00	63.600	1200	384134.661	400845.954	1.896
S3	0.032	5.00	63.650	1200	384132.641	400819.157	2.215
S4	0.122	5.00	63.650	1200	384156.312	400817.373	2.452
FCC1	0.135	5.00	63.300	1200	384145.927	400770.121	1.500
S5			63.000	1200	384152.258	400763.579	2.341
S6	0.141	5.00	63.650	1200	384182.514	400818.162	1.500
S7			63.200	1200	384178.697	400767.520	1.558
TANK			63.000	1200	384167.434	400762.435	2.493
FCC2			63.000	1200	384182.610	400761.292	2.645
C1			63.100	1200	384186.330	400764.661	2.829
SADDLE			63.100		384203.749	400762.585	4.140

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S1	S2	39.638	0.600	62.100	61.704	0.396	100.0	300	5.42	45.0
1.001	S2	S3	26.873	0.600	61.704	61.435	0.269	100.0	300	5.71	44.0
1.002	S3	S4	23.738	0.600	61.435	61.198	0.237	100.0	300	5.96	43.1
1.003	S4	S5	53.947	0.600	61.198	60.659	0.539	100.0	300	6.53	41.3
2.000	FCC1	S5	9.104	0.600	61.800	61.709	0.091	100.0	150	5.15	46.1
1.004	S5	TANK	15.219	0.600	60.659	60.507	0.152	100.0	300	6.69	40.8
3.000	S6	S7	50.786	0.600	62.150	61.642	0.508	100.0	300	5.54	44.6
3.001	S7	TANK	12.358	0.600	61.642	61.518	0.124	100.0	300	5.67	44.1
1.005	TANK	FCC2	15.219	0.600	60.507	60.355	0.152	100.0	300	6.85	40.3
1.006	FCC2	C1	5.019	0.600	60.355	60.271	0.084	60.0	150	6.92	40.1

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.572	111.1	16.6	1.200	1.596	0.136	0.0	78	1.136
1.001	1.572	111.1	24.6	1.596	1.915	0.206	0.0	95	1.269
1.002	1.572	111.1	27.8	1.915	2.152	0.238	0.0	102	1.312
1.003	1.572	111.1	40.3	2.152	2.041	0.360	0.0	125	1.449
2.000	1.005	17.8	16.9	1.350	1.141	0.135	0.0	117	1.140
1.004	1.572	111.1	54.7	2.041	2.193	0.495	0.0	149	1.566
3.000	1.572	111.1	17.0	1.200	1.258	0.141	0.0	79	1.146
3.001	1.572	111.1	16.9	1.258	1.182	0.141	0.0	79	1.146
1.005	1.572	111.1	69.5	2.193	2.345	0.636	0.0	172	1.655
1.006	1.301	23.0	69.2	2.495	2.679	0.636	0.0	150	1.325

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.007	C1	SADDLE	17.542	0.600	60.271	58.960	1.311	13.4	150	7.02	39.8

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.007	2.768	48.9	68.7	2.679	3.990	0.636	0.0	150	2.820

Pipeline Schedule

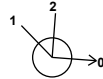
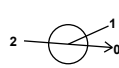
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	39.638	100.0	300	Circular	63.600	62.100	1.200	63.600	61.704	1.596
1.001	26.873	100.0	300	Circular	63.600	61.704	1.596	63.650	61.435	1.915
1.002	23.738	100.0	300	Circular	63.650	61.435	1.915	63.650	61.198	2.152
1.003	53.947	100.0	300	Circular	63.650	61.198	2.152	63.000	60.659	2.041
2.000	9.104	100.0	150	Circular	63.300	61.800	1.350	63.000	61.709	1.141
1.004	15.219	100.0	300	Circular	63.000	60.659	2.041	63.000	60.507	2.193
3.000	50.786	100.0	300	Circular	63.650	62.150	1.200	63.200	61.642	1.258
3.001	12.358	100.0	300	Circular	63.200	61.642	1.258	63.000	61.518	1.182
1.005	15.219	100.0	300	Circular	63.000	60.507	2.193	63.000	60.355	2.345
1.006	5.019	60.0	150	Circular	63.000	60.355	2.495	63.100	60.271	2.679
1.007	17.542	13.4	150	Circular	63.100	60.271	2.679	63.100	58.960	3.990

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	1200	Manhole	Adoptable	S2	1200	Manhole	Adoptable
1.001	S2	1200	Manhole	Adoptable	S3	1200	Manhole	Adoptable
1.002	S3	1200	Manhole	Adoptable	S4	1200	Manhole	Adoptable
1.003	S4	1200	Manhole	Adoptable	S5	1200	Manhole	Adoptable
2.000	FCC1	1200	Manhole	Adoptable	S5	1200	Manhole	Adoptable
1.004	S5	1200	Manhole	Adoptable	TANK	1200	Manhole	Adoptable
3.000	S6	1200	Manhole	Adoptable	S7	1200	Manhole	Adoptable
3.001	S7	1200	Manhole	Adoptable	TANK	1200	Manhole	Adoptable
1.005	TANK	1200	Manhole	Adoptable	FCC2	1200	Manhole	Adoptable
1.006	FCC2	1200	Manhole	Adoptable	C1	1200	Manhole	Adoptable
1.007	C1	1200	Manhole	Adoptable	SADDLE		Junction	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S1	384174.187	400842.975	63.600	1.500	1200					
						0	1.000	62.100	300	
S2	384134.661	400845.954	63.600	1.896	1200		1	1.000	61.704	300
						0	1.001	61.704	300	
S3	384132.641	400819.157	63.650	2.215	1200		1	1.001	61.435	300
						0	1.002	61.435	300	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S4	384156.312	400817.373	63.650	2.452	1200		1	1.002	61.198	300
							0	1.003	61.198	300
FCC1	384145.927	400770.121	63.300	1.500	1200		0	2.000	61.800	150
S5	384152.258	400763.579	63.000	2.341	1200		1	2.000	61.709	150
							2	1.003	60.659	300
							0	1.004	60.659	300
S6	384182.514	400818.162	63.650	1.500	1200		0	3.000	62.150	300
S7	384178.697	400767.520	63.200	1.558	1200		1	3.000	61.642	300
							0	3.001	61.642	300
TANK	384167.434	400762.435	63.000	2.493	1200		1	3.001	61.518	300
							2	1.004	60.507	300
							0	1.005	60.507	300
FCC2	384182.610	400761.292	63.000	2.645	1200		1	1.005	60.355	300
							0	1.006	60.355	150
C1	384186.330	400764.661	63.100	2.829	1200		1	1.006	60.271	150
							0	1.007	60.271	150
SADDLE	384203.749	400762.585	63.100	4.140			1	1.007	58.960	150

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	45	10	0

Node SADDLE Surcharged Outfall

Overrides Design Area	x	Depression Storage Area (m ²)	0	Evapo-transpiration (mm/day)	0
Overrides Design Additional Inflow	x	Depression Storage Depth (mm)	0		

Applies to All storms

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
0	1.150	300	1.150	600	1.150	900	1.150	1200	1.150
60	1.150	360	1.150	660	1.150	960	1.150	1260	1.150
120	1.150	420	1.150	720	1.150	1020	1.150	1320	1.150
180	1.150	480	1.150	780	1.150	1080	1.150	1380	1.150
240	1.150	540	1.150	840	1.150	1140	1.150	1440	1.150

Node FCC2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	60.355	Product Number	CTL-SHE-0097-5000-1600-5000
Design Depth (m)	1.600	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node FCC1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	61.800	Product Number	CTL-SHE-0070-2500-1350-2500
Design Depth (m)	1.350	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.5	Min Node Diameter (mm)	1200

Node FCC1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	62.900	Slope (1:X)	250.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.250
Safety Factor	2.0	Width (m)	32.000	Inf Depth (m)	
Porosity	0.30	Length (m)	38.000		

Node TANK Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	60.507
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

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	220.0	0.0	1.500	220.0	0.0	1.501	0.0	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	10	62.176	0.076	16.2	0.2238	0.0000	OK
15 minute winter	S2	10	61.800	0.096	24.2	0.1798	0.0000	OK
15 minute winter	S3	11	61.540	0.105	27.4	0.1490	0.0000	OK
15 minute winter	S4	11	61.324	0.126	41.4	0.2687	0.0000	OK
30 minute winter	FCC1	29	62.948	1.148	12.3	6.1117	0.0000	SURCHARGED
15 minute summer	S5	10	60.813	0.154	42.0	0.1745	0.0000	OK
15 minute winter	S6	10	62.229	0.079	16.8	0.2367	0.0000	OK
15 minute winter	S7	11	61.725	0.083	16.5	0.0933	0.0000	OK
180 minute winter	TANK	148	60.709	0.202	20.6	42.4243	0.0000	OK
120 minute winter	FCC2	122	60.725	0.370	15.5	0.4181	0.0000	SURCHARGED
120 minute winter	C1	120	60.302	0.031	4.7	0.0356	0.0000	OK
15 minute summer	SADDLE	1	60.110	1.150	4.6	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1	1.000	S2	15.9	0.951	0.143	0.6636	
15 minute winter	S2	1.001	S3	23.8	1.152	0.214	0.5560	
15 minute winter	S3	1.002	S4	27.7	1.107	0.249	0.5949	
15 minute winter	S4	1.003	S5	41.5	1.293	0.373	1.7318	
30 minute winter	FCC1	Hydro-Brake®	S5	2.3				
15 minute winter	S5	1.004	TANK	44.6	2.095	0.401	0.3479	
15 minute winter	S6	3.000	S7	16.5	1.099	0.148	0.7620	
15 minute winter	S7	3.001	TANK	16.5	1.096	0.148	0.1858	
120 minute summer	TANK	1.005	FCC2	17.1	0.406	0.154	0.8616	
120 minute winter	FCC2	Hydro-Brake®	C1	4.7				
120 minute winter	C1	1.007	SADDLE	4.7	0.384	0.096	0.1779	68.2

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	10	62.223	0.123	39.6	0.3633	0.0000	OK
15 minute winter	S2	10	61.869	0.165	59.4	0.3079	0.0000	OK
15 minute winter	S3	11	61.620	0.185	67.5	0.2630	0.0000	OK
15 minute winter	S4	11	61.437	0.239	101.7	0.5071	0.0000	OK
60 minute winter	FCC1	60	63.023	1.223	20.1	21.7629	0.0000	FLOOD RISK
360 minute winter	S5	352	61.107	0.448	17.1	0.5069	0.0000	SURCHARGED
15 minute winter	S6	10	62.277	0.127	41.0	0.3830	0.0000	OK
15 minute winter	S7	11	61.779	0.137	40.5	0.1544	0.0000	OK
360 minute winter	TANK	352	61.107	0.600	22.0	126.0576	0.0000	SURCHARGED
360 minute winter	FCC2	352	61.107	0.752	7.9	0.8500	0.0000	SURCHARGED
480 minute winter	C1	240	60.303	0.031	4.7	0.0356	0.0000	OK
15 minute summer	SADDLE	1	60.110	1.150	4.7	0.0000	0.0000	OK

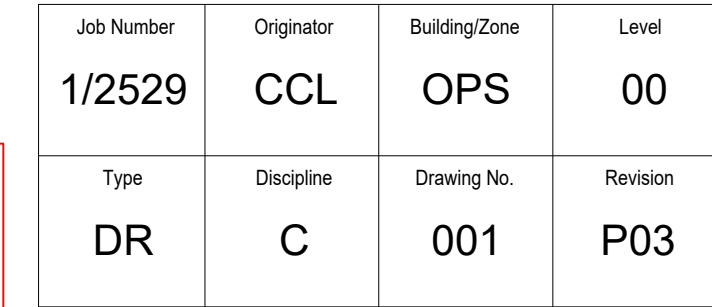
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1	1.000	S2	39.0	1.167	0.351	1.3264	
15 minute winter	S2	1.001	S3	58.5	1.378	0.527	1.1408	
15 minute winter	S3	1.002	S4	68.1	1.281	0.613	1.2547	
15 minute winter	S4	1.003	S5	102.3	1.657	0.921	3.3295	
60 minute winter	FCC1	Hydro-Brake®	S5	2.4				
15 minute winter	S5	1.004	TANK	104.8	2.342	0.943	0.8319	
15 minute winter	S6	3.000	S7	40.5	1.367	0.364	1.5043	
15 minute winter	S7	3.001	TANK	40.4	1.379	0.363	0.3618	
15 minute summer	TANK	1.005	FCC2	21.1	0.544	0.190	1.0356	
15 minute winter	FCC2	Hydro-Brake®	C1	4.7				
480 minute winter	C1	1.007	SADDLE	4.7	0.385	0.096	0.1779	175.7

Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 99.60%

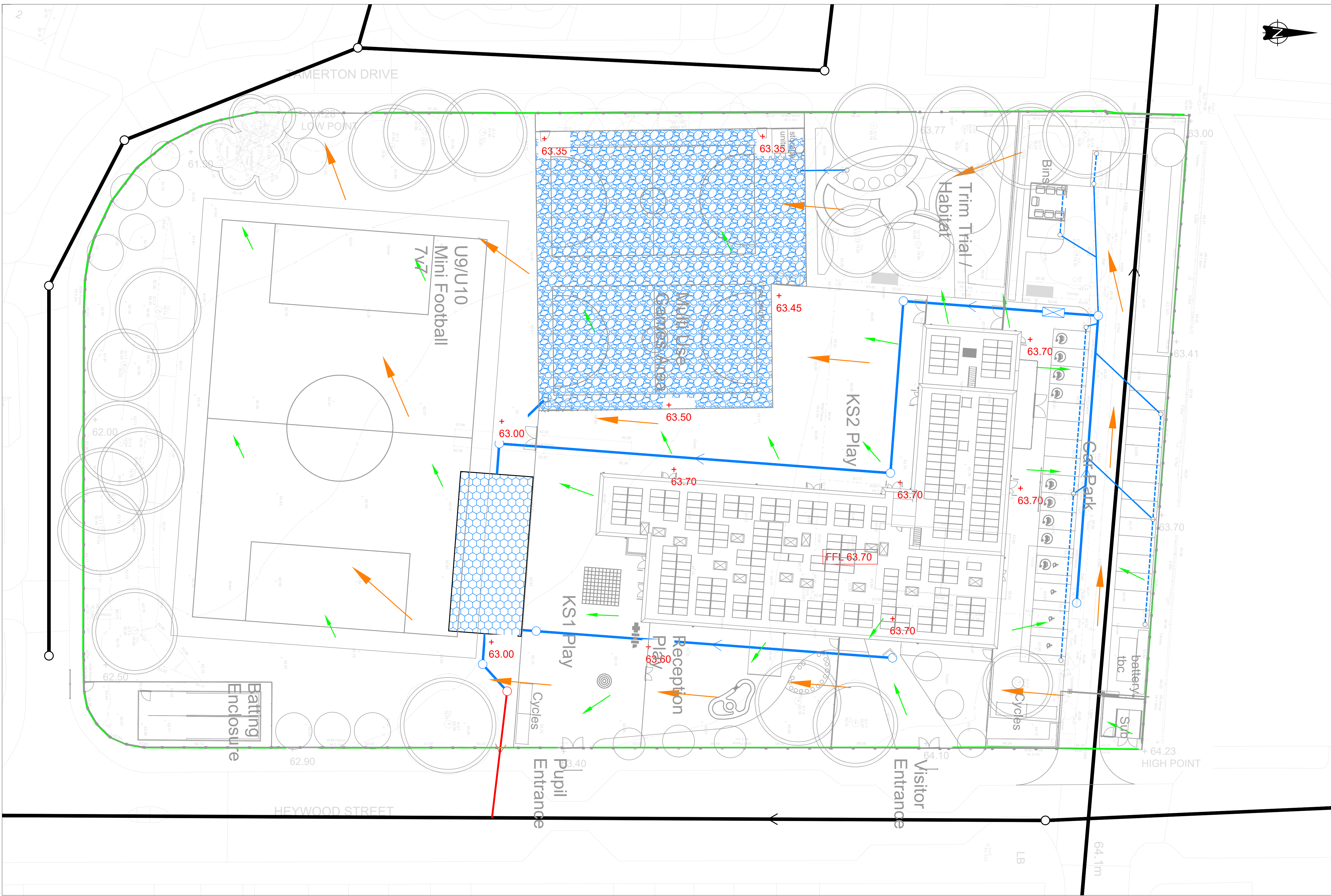
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	12	63.394	1.294	81.5	4.0460	0.0000	FLOOD RISK
15 minute winter	S2	12	63.245	1.541	99.6	2.9941	0.0000	SURCHARGED
15 minute winter	S3	12	62.999	1.564	108.9	2.2661	0.0000	SURCHARGED
15 minute winter	S4	12	62.703	1.505	170.1	3.3498	0.0000	SURCHARGED
180 minute winter	FCC1	176	63.128	1.328	19.3	59.4678	0.0000	FLOOD RISK
480 minute winter	S5	472	61.956	1.297	26.7	1.4669	0.0000	SURCHARGED
15 minute winter	S6	10	62.351	0.201	84.5	0.6443	0.0000	OK
480 minute winter	S7	472	61.956	0.314	9.5	0.3548	0.0000	SURCHARGED
480 minute winter	TANK	472	61.956	1.449	35.4	304.4125	0.0000	SURCHARGED
480 minute winter	FCC2	472	61.955	1.600	14.8	1.8099	0.0000	SURCHARGED
480 minute winter	C1	472	60.303	0.032	5.0	0.0367	0.0000	OK
15 minute summer	SADDLE	1	60.110	1.150	4.7	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	73.2	1.238	0.659	2.7913	
15 minute winter	S2	1.001	S3	93.9	1.416	0.845	1.8924	
15 minute winter	S3	1.002	S4	108.4	1.539	0.975	1.6716	
15 minute winter	S4	1.003	S5	164.3	2.333	1.479	3.7989	
180 minute winter	FCC1	Hydro-Brake®	S5	2.5				
15 minute winter	S5	1.004	TANK	165.4	2.367	1.488	1.0717	
15 minute winter	S6	3.000	S7	83.1	1.586	0.748	2.6612	
15 minute winter	S7	3.001	TANK	82.8	1.620	0.745	0.6308	
15 minute summer	TANK	1.005	FCC2	21.5	0.597	0.193	1.0717	
480 minute winter	FCC2	Hydro-Brake®	C1	5.0				
480 minute winter	C1	1.007	SADDLE	5.0	0.407	0.102	0.1790	192.4

Appendix I – Proposed Drainage Strategy Layout and Flood Exceedance Plan.



NOTE - LAYOUT BASED ON CONNECTION
TO PUBLIC COMBINED SEWER SHOULD
INFILTRATION NOT BE SUITABLE.
SUBJECT TO APPROVAL WITH THE LLFA
AND UNITED UTILITIES.



- GENERAL NOTES:
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
 - DESIGN BASED ON TOPOGRAPHICAL SURVEY AND INDICATIVE FINISHED FLOOR LEVEL.
 - DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
 - ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
 - GROUND LEVELS SHOWN ARE INDICATIVE AND SUBJECT TO CHANGE.

KEY:

- PROPOSED GROUND FALL ARROW
- OVERLAND FLOW PATH OFF SITE
- EXISTING GROUND LEVEL
- PROPOSED GROUND LEVEL
- TOPOGRAPHICAL SURVEY
- PROPOSED LAYOUT
- SITE OWNERSHIP
- SURFACE WATER DRAINAGE
- EXISTING COMBINED PUBLIC SEWER

P02	05.01.23	ISSUED FOR PLANNING	CD	DS	DS
P01	20.12.22	ISSUED FOR PLANNING	CD	DS	DS
Rev	Date	Description	By	Check	App.

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Client	CONLON CONSTRUCTION
Project	OLIVE SCHOOL, CHEETHAM HILL, MANCHESTER
Office	ALTRINCHAM
Discipline	CIVIL AND STRUCTURAL
Title	OVERLAND FLOW PLAN
Scale @ A1	1:250
Status	PRELIMINARY



Job Number	Originator	Building/Zone	Level
1/2529	CCL	OPS	00
Type	Discipline	Drawing No.	Revision
DR	C	003	P02

Appendix J – Outline Drainage Maintenance Operations.

Olive School, Cheetham Hill - 1-21529-DMS

Outline Drainage Maintenance Operations

This section is intended to give an overview of the operation and maintenance for the drainage features included with the drainage strategy and in relation to typical details. Where proprietary products are specified, the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.

The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.

Drainage components are indicated on Clancy Consulting Ltd Drainage Strategy drawing.

Components

The following components have been included within the drainage design for the proposed development:

- Inspection, Manhole and Catchpit Chambers
 - Pipes
 - Drainage Channels and Gullies
 - Perforated Pipework
 - Attenuation Tank – Type to be agreed.
 - Flow Control Unit – Type to be agreed.
 - Permeable surfacing – Type to be agreed.
 - Naylor Smart Filter – Type to be agreed.
- (See recommended maintenance sheet at the back of this document)

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.

It is assumed that the maintenance of the drainage network will be the responsibility of an on-site facilities management team.

A copy of the final construction drainage layout should be provided in the final Operations and Maintenance Manual.

The surface water network has been designed to accommodate the 1 in 100 year storm rainfall event plus an allowance for climate change particular to the requirements of the site. It may be that the exceedance flows above the 1 in 30 year storm rainfall event are stored within the site partially above ground, on non-habitable external landscaping, parking or other space. As the flows are generally being attenuated on site and within SuDs features there will be a period of time after storm events where the network is still partially or fully surcharged and is draining down. Where this surcharging is still present after 48hrs appropriate action should be taken as noted below.

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.

Long-term management practices include monthly sweeping of external paved areas. The sweeping program will remove sand and contaminants directly from paved surfaces before they become mobilised during storm events and transported to the drainage system.

During the winter months, drainage features such as gullies and channels should be cleared of ice, snow, debris or litter.

Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the filter drains and the upstream/downstream chambers.

Inspection, Manhole and Catchpit Chambers

Access points have been located at the head of each run, at a change in direction and at a change of pipe size in accordance with Building Regulations Part H.

The appropriate health and safety equipment must be used when accessing manholes. 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.

Pipes

Pipes are proprietary products and the materials can vary across the site and as such where used the manufacture's recommendations should be followed. Regardless of the product used the pipes will be fully compliant with the drainage specification.

Pipes are intended to be the main conveyance across the development and where oversized they form the attenuation volume required by the limitation of the discharge rate. They are intended to be dry except for during rainfall events. These have been designed to be self-cleaning where possible for smaller diameter pipes, and for larger diameters the risk is reduced due to the overall pipe size.

Access for maintenance is provided through access chambers and manholes.

Regular inspection and maintenance is important to identify areas which may have been obstructed/clogged and may not be drainage correctly thus exposing the development to a greater level of flood risk.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection should be provided as post construction CCTV survey.	N/A
Regular maintenance\ inspection	Inspect for evidence of poor operation via water level in chambers. If required take remedial action.	3-monthly, 48 hours after large storms.
	Check and remove large vegetation growth near pipe runs.	Monthly or as required
Remedial Action	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 and location.	As required If above does not improve performance.
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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.

Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the car park channels.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection including channel outlet boxes.	Half yearly and after large storms.
Regular maintenance\ inspection	Litter and debris removal	Monthly or as required.
	Check and remove large vegetation growth near channel 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. Silt can also be caused by adjacent landscaping areas which should be reprofiled to provide a flat area or berm adjacent to the paving.	3-monthly, 48 hours after large storms.

Remedial Action	Inspect access/outlet boxes and rod through poorly performing channels and outlets as initial remediation.	As required.
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Perforated Pipes

The perforated pipes are intended for surface water conveyance.

Access for maintenance has been provided through access chambers and rodding points.

Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection including incoming channel outlet boxes.	Half yearly and after large storms.
Regular maintenance\ inspection	Litter and debris removal	Monthly or as required
	Remove sediment from pre-treatment structures.	Monthly or as required
Remedial Action	Replace geotextiles. Terram 1000 typical design life is 25 years.	As required.
	Excavate trench walls to expose clean soils if infiltration performance reduces to unacceptable levels.	As required.

Attenuation Tanks – Type to be agreed.

The attenuation tanks are currently specified as geocellular units and are intended for storage of surface water run-off from the site up to and including the 1 in 100 year plus 50% climate change event to reduce the rate of run-off into the downstream network and to minimise flood risk.

The geocellular units are proprietary products and therefore manufacturer's recommendations should also be taken into consideration.

Access for maintenance has been provided by an access shaft located on the tank and from the manhole chambers downstream of the tank.

Geocellular units are proprietary products and therefore manufacturer's recommendations should also be taken into consideration. Additionally different manufacturers may have different connection types and arrangements which will need to be taken into consideration.

Regular inspection and maintenance is important for the effective operation of attenuation tanks as designed. As the feature is buried, a regular inspection regime is very important to ensure the correction functionality of the surface water drainage network.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets, outlets and overflows for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
Regular maintenance\ inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets, outlets and overflows.	As required.

Flow Control Units – Type to be agreed.

The flow control units are intended for flood control and flow restriction.

The flow controls are specified as Hydro-brake or similar approved and are proprietary products; therefore, manufacturer's recommendations should also be taken in to consideration.

Access for maintenance has been provided by locating within manhole chambers.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
Regular maintenance\ inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures and flow control chambers.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets.	As required.

Permeable Surfacing – Type to be agreed.

The permeable paving is intended as a first stage treatment for water quality, and also as potential attenuation for surface runoff.

Sediment\material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection	Monthly or 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
Regular maintenance\ inspection	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 manufacturers recommendations - pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this are is most likely to collect the most sediment.
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	As required.

The Smart Sponge® Family

Smart Filter®, Smart Brake® & Smart Stop® Range

The Smart Filter®:

Specifically designed for end of pipe applications and installations through which contaminated or polluted water flows. The unique design allows the Smart Filter® to either sit inside or outside the pipe connection and will absorb hydrocarbons that pass through the system during normal conditions. The Smart Filter® is available in 2 different standard sizes and will accommodate standard pipe sizes.

Flow rates are catered for through the design of the Smart Filter®, sized to take the first flush effect plus a safety factor of 2x with any excess passing through the bypass facility.



Smart Filter®



Orifice Plate

The Smart Brake®:

Is a collaboration of design from the Smart Filter® and houses the Smart Paks within a more confined area which allows normal flow through the system. The Smart Brake's® unique design works during an event and slows the flow rate whilst absorbing any hydrocarbons present, allowing the final outfall flow to disperse reducing flooding, resulting in the contaminated flow from travelling further along a water course. The Smart Brake® will also absorb any hydrocarbons present within a normal flow, effectively acting as a Smart Filter®.



Unit showing overflow connection

The Smart Stop®:

Uses the basic principles of the Smart Filter® but houses the Smart Paks within a more confined area which allows normal flow through the system. The Smart Stop's® unique design works during an event where more hydrocarbons are present within the resulting flow and the volume of hydrocarbons are quickly absorbed within the Smart Paks which swell into the defined cage and seal the outfall pipe providing the contaminated flow from travelling further along a water course. The contaminated water is then stopped at source enabling the hydrocarbon clean up to be targeted in one area reducing the impact to the environment. The Smart Brake® will also absorb any hydrocarbons present within a normal flow, effectively acting as a Smart Filter®.

N.B. A suitable silt trap device is recommended prior to the Smart Filter® chamber to prolong the life of the Smart Sponge®. If this is impractical a silt sump is recommended within the Smart Filter® chamber.

Smart Filter® Standard Range

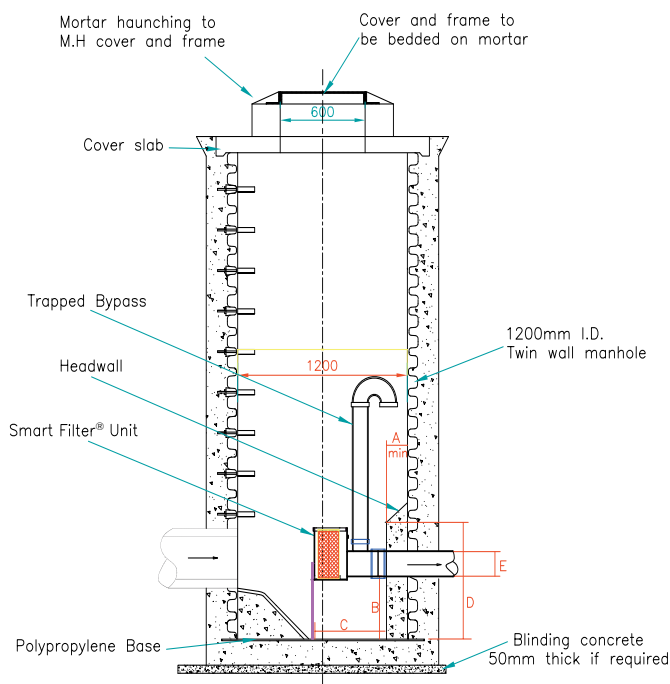
Prod No.	Description	Dims (mm)	Qty
SF01-30302	Smart Filter® c/w 2 No. 305 x 305 Std Smart Paks. 150 dia outlet for flow up to 14 l/s	360 x 330 x 330	1
SF02-38382	Smart Filter® c/w 2 No. 380 x 380 Std Smart Paks. 150 dia outlet for flow up to 22 l/s	400 x 400 x 400	1
SF01-30302P	Smart Filter® c/w 2 No. 305 x 305 Plus Smart Paks. 150 dia outlet for flow up to 14 l/s	360 x 330 x 330	1
SF02-38382P	Smart Filter® c/w 2 No. 380 x 380 Plus Smart Paks. 150 dia outlet for flow up to 22 l/s	400 x 400 x 400	1

Smart Brake® Range

Prod No.	Description	Dims (mm)	Qty
SB01-30302	Smart Brake® c/w 2 No. 305 x 305 Std Smart Paks. Specify orifice size for desired flow	360 x 330 x 330	1
SB02-38382	Smart Brake® c/w 2 No. 380 x 380 Std Smart Paks. Specify orifice size for desired flow	400 x 400 x 400	1

Smart Stop® Range

Prod No.	Description	Dims (mm)	Qty
SS01-30302	Smart Stop® c/w 2 No. 305 x 305 Std Smart Paks. 150 dia outlet for flow up to 14 l/s	360 x 330 x 330	1
SS02-38382	Smart Stop® c/w 2 No. 380 x 380 Std Smart Paks. 150 dia outlet for flow up to 22 l/s	400 x 400 x 400	1



Typical Installation showing overflow connection and silt trap.

THE **SMARTER** SOLUTION TO: Quick Installation & Maintenance

Ultra-Urban® Filters

The Ultra-Urban® Filters can be installed as a drop in unit with a collar or as a slot in system secured to the side of the gully or inlet with brackets.

The Ultra-Urban® Filter Is Easily Installed

Installation time varies depending upon mounting devices selected. A single mounting bracket made of 16-gauge galvanised steel is required for the installation of the Curb Opening (CO) series. The Ultra-Urban® Filter should not be installed where modules obstruct the drain pipe outlet. The size of the drain should allow room for stormwater over flow. The Drain Inlet (DI) series Ultra-Urban® Filter will suspend from the drain into the catch basin through a structural plastic mount and funnel mechanism.



Low Maintenance

The Ultra-Urban® Filter should be serviced as needed to remove sediment and debris, according to expected debris accumulation. The sediment and debris can be quickly vacuumed out of the modules through the opening of the drain with conventional maintenance equipment. Under normal operating conditions the Ultra-Urban® Filter should be replaced every 1-3 years.

Prod No.	Dry Weight	Spent Weight	Litres
UUF1414N	9.1kg 	27kg 	21Ltr
UUF1414H	5.9kg 	17kg 	13Ltr
UUF1616N	10.9kg 	32kg 	25Ltr
UUF1616H	8.2kg 	24kg 	19Ltr
UUF2020N	13.6kg 	40kg 	31Ltr
UUF2020H	10kg 	30kg 	24Ltr

Solutions
for Water
Framework Directive
Compliance

Smart Sponge® & Smart Sponge® **PLUS** technology effectively and efficiently reduces the amount of coliform bacteria, debris and hydrocarbons, to keep the UK's beaches, marinas, airports regulations in compliance with Bathing Water Directive and Stormwater regulations.



Appendix K – SuDS Proforma.

NORTH WEST SuDS PRO-FORMA

This pro-forma is a requirement for any planning application for major development¹.

It supports applicants in summarising and confirming how surface water from a development will be managed sustainably under current and future conditions.

Your sustainable drainage system should be designed in accordance with [CIRIA The SuDS Manual C753](#) and any necessary adoption standards.

HOW TO COMPLETE

Blue Box	Instruction/ Question
Orange Box	Evidence Required
White Box	To be completed by Developer / Consultant

1. Complete ALL white boxes
2. Submit this pro-forma to the Local Planning Authority, along with:
 - Sustainable Drainage Strategy
 - Site Specific Flood Risk Assessment (if required)
 - Minimum supporting evidence, as indicated in orange boxes of this pro-forma.

GUIDANCE TO SUPPORT YOU

The pro-forma should be completed in conjunction with 'Completing your SuDS Pro Forma Guide.'

The pro-forma can be completed using freely available tools such as [Tools for Sustainable Drainage Systems](#) or appropriate industry standard surface water management design software.

¹ as defined in Section 2 of [Statutory Instrument 2015 No. 595](#) or on sites of 0.5 hectares in Critical Drainage Areas.

SECTION 1. APPLICATION & DEVELOPMENT DETAILS

Planning Application Reference <i>(if available)</i>	Not available	
State type of planning application <i>i.e. Pre-application, Outline, Full, Hybrid, Reserved Matters*</i> <i>*Information only required if drainage is to be considered as part of reserved matters application</i>	Full	
Developer(s) Name:	Conlon Construction Ltd	
Consultant(s) Name:	Clancy Consulting Ltd	
Development Address <i>(including postcode)</i>	Bignor Park, Cheetham Hill - M8 OTZ	
Development Grid Reference <i>(Eastings/Northings)</i>	E384150 N400796	
Total Development Site Area (Ha)	1.259ha	
Drained Area (Ha)* of Development	0.60ha	
Please indicate the flood zone that your development is in. Tick all that apply. <i>Based on the Environment Agency Flood Map for Planning and the relevant Local Authority Strategic Flood Risk Assessment (to identify Flood Zones 3a/3b).</i>	Flood Zone 1 ☒ Flood Zone 2 ☐ Flood Zone 3a ☐ Flood Zone 3b ☐	
What is the surface water risk of the site? Tick all that apply. <i>Based on the Environment Agency Surface Water Flood Map.</i>	High ☐ Medium ☐ Low ☒	
Have you submitted a Site Specific Flood Risk Assessment (FRA)? <i>See separate guidance notes for clarification on when a FRA is required</i>	Yes ☒ No ☐	
Have you submitted a Sustainable Drainage Strategy?	Yes ☒ No ☐	
Does your drainage proposal provide multi-functional benefits via SuDS?	Yes ☒ No ☐	
Expected Lifetime of Development <i>(years)</i> <i>Refer to Planning Practice Guidance "Flood Risk and Coastal Change" Paragraph 026</i>	60 tbc by Architect	
Development Type:	State Proposed Number of Residential Units / Quantum of commercial floorspace	
Greenfield Site Site is wholly undeveloped, and a new drainage system will be installed	☒	
Previously Developed/ Brownfield Site - Site is already developed, and the <u>entirety</u> of the existing surface water drainage system will be used to serve the new development (evidence must be provided to prove existing surface water drainage system is reusable); OR - Where records of the previously developed system are not available so that the hydraulic characteristics of the system cannot be determined or where the drainage system is not in reasonable working order i.e. broken, blocked or no longer operational for other reasons, then one of the approaches outlined in Section 24.5 of The SuDS Manual (C753) should be adopted.	☐	

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 1.

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- FRA&DS

SECTION 2: IMPERMEABLE AREA AND EXISTING DRAINAGE

	Existing (E)	Proposed (P)	Change (P – E)
State Impermeable Area (Ha)	0.2642	0.6346	0.3704
Evidence Required: Plans showing development layout of site with existing and proposed impermeable areas.			☒

Are there existing sewers, watercourses, water bodies, highway drains, soakaways or filter drains on the site?	Yes ☒ No ☐ Don't Know ☐
Evidence Required: Plan(s) showing existing layout to include all: - Watercourses, open and culverted - Water bodies – ponds, swales etc. - Sewers, including manholes - Highway drains, include manholes, gullies etc. - Infiltration features - soakaways, filter drains etc.	☒

Drainage Design <u>Outline planning applications</u> should be able to demonstrate that a suitable drainage system is achievable. <u>All other type of planning application</u> should provide full details or reference to previous planning application where drainage details have been submitted or approved.		
Select which design approach you are taking to manage water quantity (refer to Section 3.3 SuDS Manual)		
Approach 1 – Volume control / Long Term Storage (Technical Standards S2/3, S4/5) - The attenuated runoff volume for the 1 in 100 year 6 hour event (plus climate change allowance) is limited to the greenfield runoff volume for the 1 in 100 year 6 hour event, with any additional runoff volume utilising long term storage and either infiltrated or released at 2 l/s/ha - The discharge rate for the critical duration 1 in 1 year event is restricted to the 1 in 1 year greenfield runoff rate - The discharge rate for the critical duration 1 in 100 year event (plus climate change allowance) is restricted to the 1 in 100 year greenfield runoff rate	☐	
Approach 2 – Qbar (Technical Standards S6) Justification has been provided that the provision of volume control/long term storage is not appropriate and an attenuation only approach is proposed. All events up to the critical duration 1 in 100 year event (plus climate change allowance) are limited to Qbar (1 in 2 year greenfield rate) or 2 l/s/ha, whichever is greater.	☐	
Evidence Required: Plans showing: - Existing flow routes and flood risks - Modified flow routes - Contributing and impermeable areas - Current (if any) and proposed 'source control' and 'management train' locations of sustainable drainage components (C753 Chapter 7) - Details of drainage ownership - Details of exceedance routes (Technical Standards S9) - Topographic survey - Locations and number of existing and proposed discharge points		☐

5 l/s AGREED IN PRINCIPLE
WITH UNITED UTILITIES.
ATTENUATION PROVIDED
FOR 1 IN 100 YEAR PLUS 45%
CC AND 10% UC. SEE
FRA&DS.

Note consideration should be given to manage surface water from both impermeable and permeable surfaces (including gardens and verges) likely to enter the drainage system.

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 2.

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SECTION 3: PEAK RUNOFF RATES – TECHNICAL STANDARDS S2, S3 AND S6 (UNLESS S1 APPLIES)

Rainfall Event	Existing Rate (l/s)	Greenfield Rate (l/s)	Proposed Rate (l/s) <i>Previously developed sites - In line with S3 should be equivalent to Greenfield runoff rates – discuss with LLFA if this is not achievable pre-application</i>
Qbar (Approach 2)	EXISTING HARD STANDING AREA (0.26ha) GENERATES 35l/s IN THE PEAK 1 YEAR EVENT AND GREATER IN THE 30 AND 100 YEAR. Greater than 35 THE REMAINING SOFT AREAS (1.02ha) GENERATE 5.2, 10 AND 12.3 l/s IN THE 1, 30 AND 100 YEAR RESPECTIVELY. Greater than 35		THE PROPOSED MAXIMUM DISCHARGE RATE IS 5 l/s FOR ALL STORMS.
1 in 1 Year Event (Approach 1)			
1 in 30 Year Event			
1 in 100 Year Event* (Approach 1)			
* Total discharge at the 1 in 100 year rate should be restricted to the greenfield runoff volume for the 1 in 100 Year 6 hour event with additional volumes (long-term storage volume) released at a rate no greater than 2 l/s/ha where infiltration is not possible. The climate change allowance should only be applied to the proposed rate and not the existing or greenfield rate.			
Evidence Required: Methodology used to calculate peak runoff rate clearly stated and justified.		Wallingford Method, see FRA&DS Section 6.1.	☒
Impermeable areas plan, supported by topographical survey confirming positive drainage.			☒
Hydraulic calculations and details of software used.			☐

State the hydraulic method used in your calculations
(Refer to Table 24.1 of The SuDS Manual)

Modified Rational Method

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 3.

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SECTION 4: DISCHARGE VOLUME – TECHNICAL STANDARDS S4, S5 AND S6 (UNLESS S1 APPLIES)

Rainfall Event	Existing Volume (m ³)	Greenfield Volume (m ³)	Proposed Volume (m ³)
1 in 100 Year 6 Hour Event (Approach 1)			
Does the below statement apply to your development proposal? Long term storage is not achievable on this site and, in accordance with S6 of the Non Statutory Technical Standards for SuDS, the surface water discharge rates for events up to and including the 1 in 100 year critical event are limited to Qbar (Approach 2)			Yes ☒ No ☐
Evidence Required: Approach to managing the quantity of surface water leaving the site clearly stated and justified Methodology used to calculate discharge volume clearly stated and justified. Hydraulic calculations and details of software used.			☐ ☐ ☐

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 4.	1-21529-CCL-OS-00-RP-C-00 01 - FRA&DS
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SECTION 5: STORAGE – TECHNICAL STANDARDS S7 AND S8

State climate change allowance used (%)	45
State housing density (houses per ha)	n/a
State urban creep allowance used (%)	10
Evidence Required: State / used in appropriate industry standard surface water management design software.	☒

State storage volume required (m³) (excluding non-void spaces) <i>Must include an allowance for climate change and urban creep</i>	400m3
Have you incorporated interception into your design? <i>(Refer to Chapter 24 of The SuDS Manual C753)</i> <i>Where possible, infiltration or other techniques are to be used to try and achieve zero discharge to receiving waters for rainfall depths up to 5mm.</i>	Yes ☐ No ☒
Evidence Required: Drainage plans showing location of attenuation and all flow control devices and supporting calculations.	☒

Summarise how storage will be provided for 1 in 30 year event on site. <i>Storage must be designed to ensure that at no flooding occurs onsite in a 1 in 30 year event except in designed areas and no flooding occurs offsite in a 1 in 100 year (plus climate change allowance) event.</i>	Cellular storage, pipes and chamber, sub-base voids.
Summarise how storage will be provided for 1 in 100 year (plus climate change) event on site. <i>Where storage above the 1 in 30 year rainfall event is provided in designated areas designed to accommodate excess surface water volumes, plans showing storage locations and surface water depths and supported by calculations used in appropriate industry standard surface water management design software. It is important to run a range of duration events to ensure the worst case condition is found for each drainage element on the site</i>	Cellular storage, pipes and chamber, sub-base voids
Evidence Required: Plans showing size and location of storage and supporting calculations. Where there is controlled flooding, extents and depths must be indicated.	☒

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 5.	1-21529-CCL-OS-00-RP-C-0001 - FRA&DS
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SECTION 6: WATER QUALITY PROTECTION

Contaminated surface water run-off can have negative impacts on the quality of receiving water bodies. The potential level of contamination will influence final the design of an appropriate treatment train as part of your sustainable drainage system.

Is the proposal site known to be or potentially contaminated?	Yes ☐	No ☒
If the site is contaminated, it should be demonstrated that the sustainable drainage system will not increase the risk of pollution to controlled waters through the mobilisation of contaminants and/or creation of new pollution pathways.		

Confirm the Pollution Hazard Level of the proposed development - Tick ALL that apply		
Refer to Pollution Hazard Indices for different Land Use Classifications in Table 26.2 of The SuDS Manual C753 for further guidance.		
Pollution Hazard Level Tick ALL that apply	Surface water run-off from the proposed development will drain from:	
VERY LOW	☐	Residential roofs
LOW	☒	- Other roofs (typically commercial/industrial roofs) - Individual property driveways, residential car parks, low traffic roads (e.g. cul de sacs, home-zones and general access roads) - Non-residential car parking with infrequent change (e.g. schools, offices) i.e. < 300 traffic movements/day
MEDIUM	☐	- Commercial yard and delivery areas - Non-residential car parking with frequent change (e.g. hospitals, retail) - All roads except low traffic roads and trunk roads/motorways²
HIGH	☐	- Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites) - Sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured - Industrial sites - Trunk roads and motorways¹

If the development's Pollution Hazard Level is 'Very Low' or 'Low', has the sustainable drainage design been risk assessed and appropriate mitigation measures included?	Yes ☒	No ☐
If the proposed development has a very low or low polluting potential, you should design your sustainable drainage system to include an appropriate treatment train in accordance with The SuDS Manual (C753).		

If the development's Pollution Hazard Level is 'Medium' or 'High', is the application supported by a detailed water quality risk assessment?	Yes ☐	No ☒
- If the proposed development has a high polluting potential, a detailed risk assessment <i>will</i> be required to identify an appropriate SuDS treatment train and ensure compliance with Paragraph 170 of the National Planning Policy Framework. - If the proposed development has a medium polluting potential, a detailed risk assessment <i>may</i> be required depending on the nature, scale and location of the development.		

Has pre-application advice on water quality been obtained from the Environment Agency?	Yes ☐	No ☒
If YES, provide details:		

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 6.	1-21529-CCL-OS-00-RP-C-0001 - FRA&DS
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² Motorways and trunk roads should follow the guidance and risk assessment process set out in Highways Agency (2009).

SECTION 7: DETAILS OF YOUR SUSTAINABLE DRAINAGE SYSTEM

a) Function of your Sustainable Drainage System

Do your proposals store rainwater for later use (as a resource)?	Yes ☐ No ☒
Evidence Required: Please provide a brief sentence in the adjacent white box to describe how this function has been achieved.	Architect to confirm rainwater harvesting proposals if any.

Do your proposals promote source control to manage rainfall close to where it falls? (e.g. promoting natural losses through soakage, infiltration and evapotranspiration)	Yes ☒ No ☐
Evidence Required: Please provide a brief sentence in the adjacent white box to describe how this function has been achieved.	sub base void storage

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 7a.	1-21529-CCL-OS-00-RP-C-0001 - FRA&DS
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b) Hierarchy of Drainage Options – Planning Practice Guidance

The proposed method of discharge are set out within order of priority. Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.

Proposed method of surface water discharge		Is this proposed?	
Hierarchy Level 1: Into the ground (via infiltration)		Yes ☐ No ☒	
If YES - Evidence Required		If NO – Evidence Required Tick ALL that apply	
☐	A. Completed Infiltration Checklist from The SuDS Manual (C753) Appendix B <i>An editable version of this form is available on SusDrain website.</i>	☐	A. Site investigation to demonstrate that the ground is not free draining. Test results to be provided in accordance with: - The methodology within BRE 365 (2016), OR - Falling head permeability tests BS EN ISO 22282-2: 2012
☐	B. British Geological Survey (BGS) Infiltration SuDS Map	☐	B. NOTE: where an applicant is unable to access a site to undertake testing, e.g. where unable to access a site for an outline application, they can submit a SuDS GeoReport or similar.
☐	C. Infiltration testing to BRE 365 (2016) or falling head permeability tests to BS EN ISO 2228-2: 2012 (optional for outline)	☐	C. Evidence to confirm that infiltration to ground would result in a risk of deterioration to ground water quality.
☐	'Plan B' sustainable drainage plan and statement of approach with an alternative discharge method, in case infiltration proposals are proven not feasible upon further site specific ground investigation e.g. to consider seasonal variations to groundwater.	☐	D. Geotechnical advice from a competent person* which determines that infiltration of water to ground would pose an unacceptable risk of geohazards to the site and/or local area. <i>*Note: Competent person may include a Chartered Engineer, Chartered Geologists, Registered Ground Engineering Professionals (RoGEP).</i>

INFILTRATION TESTING IS PROPOSED JANUARY 2023. AT THE TIME OF WRITING THIS REPORT NO RESULTS AVAILABLE THEREFORE CANNOT CONFIRM VIABILITY.

Proposed method of surface water discharge		Is this proposed?	
Hierarchy Level 2: To a surface water body (<i>select type</i>) NOTE: Consent from LLFA or Permit from Environment Agency may be required – refer to guidance		Yes	No
		N/A ✓	
		☐ Main river	☐ Canal
		☐ Ordinary watercourse	☐ Other water body
If YES - Evidence Required		If NO – Evidence Required Tick <u>ALL</u> that apply	
☐	Surface water body / watercourse survey and report	☐	Plan showing nearby watercourses and waterbodies AND ☐ Statement providing justification in your Sustainable Drainage Strategy Note: Where third party land is cited as a barrier, you should provide visibility of discussions held to date with the riparian landowner of the waterbody.

Proposed method of surface water discharge		Is this proposed?	
Hierarchy Level 3: To a surface water sewer. N.B. Trafford will not accept surface water drainage to a highway drain		Yes	No
		N/A ✓	
		☐ Surface water sewer	
If YES - Evidence Required		If NO – Evidence Required Tick <u>ALL</u> that apply	
☐	Written correspondence from Water and Sewerage Company regarding proposed connection.	☐	Plan showing nearby sewers AND ☐ Statement providing justification in your Sustainable Drainage Strategy

Proposed method of surface water discharge		Is this proposed?	
Hierarchy Level 4: To combined sewer		Yes ☒	No ☐
		N/A ☐	
If YES - Evidence Required		If NO – Evidence Required	
☒	Written correspondence from Water and Sewerage Company	N/A	

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 7b.	1-21529-CCL-OS-00-RP-C-0001 - FRA&DS
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c) Proposed SuDS Component Types

	Tick ALL that apply				
Within property boundary	☐ Rainwater harvesting	☐ Green/ blue roofs	☒ Pervious pavements [Type: A ☒ B ☐ C ☐	☐ Soakaway	☐ Bio retention systems

	Tick ALL that apply				
Within development site boundary (not property)	☐ Infiltration system [Type: ☐ Surface level ☐ Below ground]		☐ Filter strips	☒ Filter drains	☐ Swales
	☐ Bio retention system	☐ Detention basins	☐ Ponds and wetlands	☒ Attenuation tanks/ Oversized pipes	☒ Other (state below)
	If 'Other' please state: permeable surfacing, smart sponge technologies, increase permeable areas, flow restrictions, below ground storage SUB BASE VOIDS.				

Off site (not within the boundary of the proposed development)	Please state: N/A
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I confirm that the above selected components have been designed in accordance with The SuDS Manual (C753).	I confirm ☒
I confirm that the management of flows resulting from rainfall in excess of a 1 in 100 year plus climate change rainfall event, and their exceedance route(s), has been fully considered in order to minimise the risks to people, property (new and existing) and infrastructure.	I confirm ☒

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 7c.	1-21529-CCL-OS-00-RP-C-0001 - FRA&DS
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Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 8.	1-21529-CCL-OS-00-RP-C-0001 - FRA&DS
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DECLARATION AND SUBMISSION

This pro-forma has been completed using evidence from information which has been submitted with the planning application.

The information submitted in the Sustainable Drainage Strategy and site-specific Flood Risk Assessment (FRA), where submitted, is proportionate to the site conditions, flood risks and magnitude of development and I agree that this information can be used as evidence to this sustainable drainage approach.

Agent Details			
Completed by	Carl Dawson	Email Address	carl.dawson@clancy.co.uk
		Telephone Number(s)	0161 613 6012
Signed off by		Accreditation(s) and/or Qualification(s) of Signatory	
Date (dd/mm/yyyy)	20.12.22	Company	Clancy Consulting Ltd

Client Details			
Name	John Hicks	Company	Conlon Construction Ltd