

FLOOD RISK ASSESSMENT & OUTLINE DRAINAGE STRATEGY

PROPOSED WOMEN'S TRAINING FACILITY

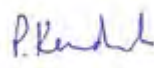
At

550 ASHTON NEW ROAD, MANCHESTER

For



Quality Management

Job No	13636		
Project	Proposed Construction of Women's Training Facility at MCFC		
Location	550 Ashton New Road, Manchester, M11 4AA		
Title	Flood Risk Assessment and Outline Drainage Strategy		
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1. Executive Summary

- 1.1 The proposal is for the repurpose and extension of former bank to create new training facility with associated earthworks, landscaping, boundary treatment, parking and access at 550 Ashton New Road, Manchester, M11 4AA. Overall red line boundary is approximately 1.27 ha in plan footprint.
- 1.2 In accordance with the National Planning Policy Framework and the Manchester City Council (MCC) Strategic Flood Risk Assessment, this report has studied and assessed the flood risk to the site by all sources. A review of the EA Flood Maps shows that the site is located within Flood Zone 1, i.e. land defined as having less than a 1 in 1000 annual probability of flooding from of fluvial or tidal water in any year.
- 1.3 The development target has been assessed against the NPPF 'Sequential Test'. Taking into consideration that the application is for a training facility development in Flood Zone 1, Tables 1, 2 & 3 of the NPPF have been appraised to confirm that the development is appropriate, and an Exception Test would not be required.
- 1.4 The Flood Risk Assessment has considered all other forms of flooding and overall, has found that the site is at low risk of flooding from all other sources.
- 1.5 There is no residual flood risk from the development site to the surrounding district as storm water flow rates discharging into the adjacent combined water sewer will be restricted to a peak rate of 5.0l/s. The development does not therefore increase the risk of surface water flooding to other adjacent neighbourhoods.
- 1.6 Sustainable Drainage Systems (SuDS) in the form of Site Control methods will be incorporated. Other SuDS have been considered but discounted due to the development type, layout and location. An outline surface water drainage strategy forms part of this report.
- 1.7 Foul drainage generated from the new development will merge with the controlled surface water discharge and outfall to the combined sewer to the north west of the site. The foul discharge does not present an increased flood risk to the surrounding district.

2 Introduction

- 2.1 Marston and Grundy LLP (M&G) have been appointed by MCFC to prepare this Flood Risk Assessment (FRA) and Outline Drainage Strategy to support a full planning submission for the repurpose and extension of former bank to create new training facility with associated earthworks, landscaping, boundary treatment, parking and access at 550 Ashton New Road, Manchester, M11 4AA.
- 2.2 The assessment has been undertaken in line with Section 10 of the 'National Planning Policy Framework' plus the accompanying Technical Guidance on Flood Risk.
- 2.3 This FRA has been commissioned by MCFC and is specific to their interests in the development proposals as described by the Architectural plan in Appendix A. This report may not be assigned without agreement with Marston and Grundy LLP.
- 2.4 The report has been prepared to identify any flood related issues associated with the proposed development and any likely constraints that could be imposed, along with considering the drainage strategy for it. The following issues have been suggested by the Environment Agency (EA), Manchester City Council (MCC) as Lead Local Flood Authority (LLFA) and United Utilities (UU), and subsequently addressed within this report.
- Identify available data relating to flood risk at the site.
 - Determine whether the site is at risk from flooding from all sources, including from breach or overtopping of any existing flood defences, surface water flooding and/or ground water flooding.
 - Consider the flood risk from all other sources.
 - Determine the current surface water drainage regime and assess any potential increase in surface water runoff as a result of the proposed development.
 - Discuss Sustainable Drainage Systems (SuDS) as an option for reducing surface water flood risk.
 - Devise an appropriate outline surface water drainage strategy (including calculations where appropriate) to deal with any potential increase in surface water runoff and include for climate change.
 - Consider the recommendations of the MCC Strategic Flood Risk Assessment (SFRA).
 - Assess mitigation measures and off-site impacts and define any residual risks.

3 Development Description and Location

3.1 Site Location

3.1.1 The site is referenced in Figure 1, and a site location map is provided in Appendix A.

Item	Brief Description
Project name	MCFC Women's Training Facility
Site address and location	Ashton New Road, Manchester, M11 4AA.
Council Area	Manchester City Council
Approximate Grid Reference	OS: 387805, 397817
General Locality	The proposed development site is located on the eastern periphery of Manchester Town Centre.

Figure 1 Site Referencing Information

3.2 Existing Site Description

3.2.1 The development site (Red Line Boundary) is irregular in plan shape and is located at the north eastern edge of the Etihad campus.

3.2.2 The development area currently encompasses a derelict bank building to the north east corner, acting as a storage facility by MCFC, with an adjoining car park and access leading off Ashton New Road. To the south of the bank building is an expanse of mature trees that run from east to west that along with a raised bank provide a visual protection to the training pitches beyond.

3.2.3 The existing bank access will be removed, and the redevelopment will utilise the existing large car park entrance from Ashton New Road to the west.

3.2.4 A number of training football pitches are located to the south and within the campus grounds. To the north is Ashton New Road and abuts the proposed site with a large commercial area beyond. Directly to the east and abutting the site is the Ashton Canal, with an industrial area beyond.

3.2.5 Figure 2 overleaf identifies the overall site location details. Further details of the existing layout can be seen on the Red Line Plans in Appendix A.



Figure 2 Site Location

3.3 Topography

- 3.3.1 A review of the topographical survey would indicate that the former bank building holds a level of 67.20m AOD, a nominal rise up from the highway levels of Ashton New Road. To the south of the bank is a raised embankment leading up to circa 70m AOD and which then drops down on the opposite side to the training pitches at circa 65.30m AOD. The retaining entrance car park also holds a level at circa 65.00m AOD. Full details of the topographical survey is provided in Appendix B.

3.4 Hydrology

- 3.4.1 The closest identified watercourse is the River Medlock, located some 800m to the north west of the site.
- 3.4.2 The Ashton Canal abuts the site directly to the northeast of the site.

4 Planning Policy and Consultation

4.1 Planning Policy Framework

4.1.1 The flood maps provided by the Environment Agency (EA) locate the site in low-risk flood zone 1, i.e. land defined as having an annual probability of fluvial flooding of less than 1 in 1000 in any year (<0.1%). As a requirement of the new NPPF (2023), Annex D, the proposed development should satisfy the requirements of the Sequential Test and where applicable the Exception Test.

4.1.2 Sequential Test:

Under the NPPF (2023), Zone 1 is defined as low probability flood risk. The proposal is for a training development, which in line with Table 2 is classified as 'Less Vulnerable'.

Placing both these criteria into Table 3 (Flood Risk Vulnerability and Flood Zone 'Compatibility'), More Vulnerable development in Flood Zone 1 determines that the development is appropriate, and the sequential test is passed.

4.1.3 Exception Test:

As the Sequential test is passed, the Exception test is therefore not required.

4.2 Strategic Flood Risk Assessment (SFRA)

4.2.1 Manchester City Council in consultation with adjacent authorities, produced the Manchester City Salford City and Trafford Councils Hybrid Level 2 Strategic Flood Risk Assessment (2011) to demonstrate and define its understanding and role in managing flood risk. A fundamental aim of the strategy is that the Council embraces and supports its role as Lead Local Flood Authority, and this means taking the lead in helping with infrastructure development and re-development and working with other bodies in dealing with flood risk. The Council wants to encourage and wherever possible enforce current thinking and guidance and be able to provide improvements through working better together. The Strategy is aimed at providing an overview and assessment of local flood risk, setting out objectives and measures for how the Council will manage and reduce local flood risk. This Strategy builds on existing and developing approaches to flood risk management and promotes the use of a wide range of measures to manage flood risk. Risk should be managed in a co-ordinated way within catchments and balance the needs of communities, the economy and the environment.

4.2.2 A summary of the main elements from the SFRA associated with the district is detailed below. The full report can be obtained from the MCC website.

- The most significant sources of flood risk are fluvial and surface water.
- To better understand local flood risk and make best use of available information to better manage flood risk to people, businesses, property, infrastructure and the natural environment.
- To reduce the potential impact and costs of flooding in the area.

- To ensure resilience of local water bodies and drainage assets.
- To ensure appropriate development in areas of flood risk.
- To develop a collaborative partnership approach to flood risk management, and cooperate with other Risk Management Authorities (RMAs) and key stakeholders working across catchments.
- To assist communities in understanding information on flood risk and supporting themselves.
- Development should aim to deliver greenfield runoff rates on greenfield sites up to a 1 in 100-year storm event, considering climate change.
- Development should be designed so that there is no flooding to the development in a 1 in 30-year event and so that there is no property flooding in a 1 in 100 year plus climate change event.
- For all sites, development proposals should look at opportunities to incorporate SuDS to reduce the risk of surface water flooding.

5 Definition of Flood Hazard

5.1 Generally

Flood risk to the proposed development site is considered from all sources of flooding, as defined by the NPPF (2021).

5.2 Sources of Information

5.2.1 The NPPF (2021) requires the developer to consider the impact of runoff generated by the proposed development onto the downstream catchment, and to assess the risk of runoff from the surrounding district impacting on the development's footprint. Further, the report is to consider flood risk from all other sources. The following section defines the flood risk receptors and anticipated flood risk. Section 5.8 then tabulates the probability of flooding and the likely impacts.

5.2.2 Figure 3 summarises the main sources of information used in the identification of flood risk.

Source of Information	Details
Environment Agency	From EA website
United Utilities	Sewer Records
Historic Maps/Reports	From various websites
Manchester SFRA	Report & Various Maps

Figure 3 Sources of information used in the identification of flood risk

5.3 Flooding from Rivers (Fluvial) and Estuaries (Tidal)

5.3.1 Although the Ashton Canal abuts the site to the east, the closest identified watercourse is the River Medlock, located some 800m to the north west.

5.3.2 Figure 4 overleaf locates the site on the Environment Agency's indicative floodplain map. It is clear from this that both the red line and development boundaries are located outside of a fluvial generator of flood water from any identified water body or river. Therefore, it is considered that the site lays outside of the active 100-year and extreme event floodplains, thus lying within 'Flood Zone 1 Classification' in accordance with NPPF Guidance, i.e. probability of annual fluvial flooding significantly less than 1 in 1000 in any one year (<0.1%). The risk from fluvial flood water is diminished to acceptable levels, removing the requirement for further investigation and assessment of the fluvial flood regime.

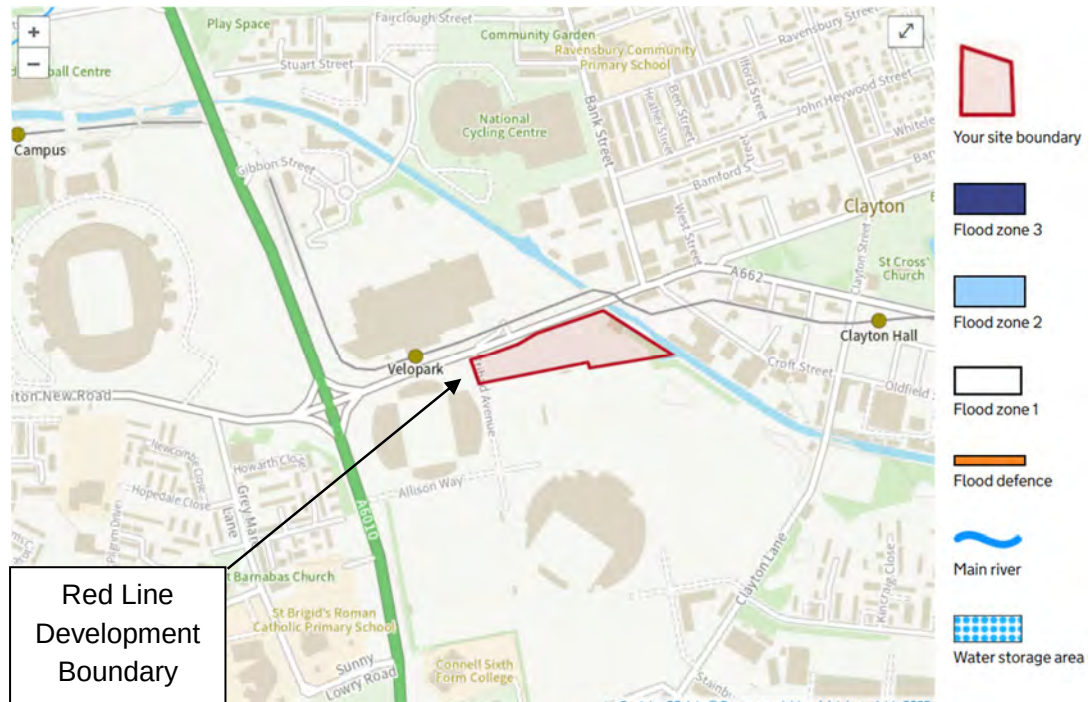


Figure 4 The EA's Indicative 100-year Flood Plain Map

5.4 Flooding from Land (Overland Flow)

5.4.1 The EA descriptions for the High, Medium and Low risk scenarios for surface water flooding are as follows:

- High risk means that each year this area has a chance of flooding of greater than 3.3%.
- Medium risk means that each year this area has a chance of flooding of between 1% and 3.3%.
- Low risk means that each year this area has a chance of flooding of between 0.1% and 1%.
- Very Low risk means that each year this area has a chance of flooding of less than 0.1%.

5.4.2 The general land fall across the site is in a westerly towards the retained car park. The raised derelict bank building above Ashton New Road, the lower lying Canal to the east and the elevated embankment to the south prevent any overland flood flows into the main development area.

5.4.3 According to the EA's Indicative Surface Water Floodplain map (Figure 5 below) the main development site area is classified as at medium to high risk of surface water flooding within the lower centre. Based on the raised embankment and no apparent low-lying areas at this part of the site, it can only be assumed that the maps are based on old digital LIDAR mapping prior to the Etihad Training Campus being completed.

- 5.4.4 Furthermore, the development will mitigate against this risk by replacing the current ground with new building levels to suit the development intent. All new impermeable areas will be directed into a new underground drainage network designed in line with local and national guidance. As such surface water will not pose a flood risk to the development.
- 5.4.5 There are no existing overland surface water flow routes through the site that would need to be maintained. Therefore, based on this assessment, the site can be considered at low risk from surface water flooding.

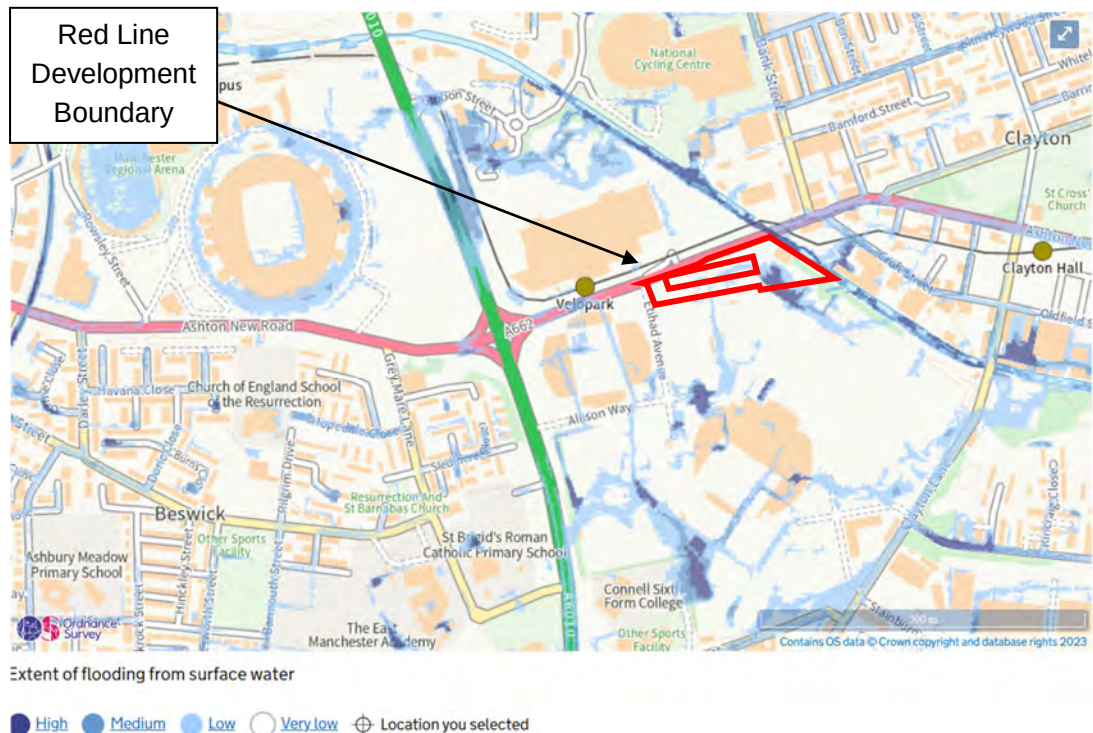


Figure 5 The EA's Indicative Surface Water Flood Map

5.5 Flooding from Sewers and Private Drainage

- 5.5.1 The United Utilities (UU) sewer records have been reviewed and confirm that there is a 225mm diameter combined water sewer flowing west within Ashton New Road that outfalls to a larger 450mm diameter combined sewer that flows south across the existing car park and into the main Campus site. No surface water sewers have been identified in close proximity. Full details of the UU sewer plans can be found in Appendix C.
- 5.5.2 A review of the private drainage plans has indicated that the former bank building and adjacent car park outfalls to the 225mm diameter combined water sewer via a 150mm diameter combined drain.
- 5.5.3 The extensive UU adopted and private drainage networks serving the surrounding district ensures that the development footprint is protected from the impact of both upstream and downstream runoff. It would be anticipated that complete protection may well exist beyond a storm event equivalent to the 30-year statistical event.

Beyond this projection, there may be a small degree of peripheral 'Exceedance' flooding. However, this is expected to be localised and restricted to the location of specific manhole covers. Thus, flood risk to the site from sewers is diminished to acceptable levels.

5.6 Flooding from Groundwater

- 5.6.1 In general terms, groundwater flooding can occur from three main sources, raised water tables, seepage and percolation, and groundwater recovery or rebound. If groundwater levels are naturally close to the surface, then this can present a flood risk during intense rainfall.
- 5.6.2 At the time of writing a site-specific intrusive phase 2 site investigation has been carried out at the site. This has indicated a relatively high ground water table that will fluctuate to suit the ground conditions and seasonal variations.
- 5.6.3 As there are no basements proposed, it is considered that any groundwater issues can be mitigated as required. The risk to the site from groundwater flooding is therefore considered to be low.

5.7 Flooding from Artificial Sources

- 5.7.1 Reservoir flooding is extremely unlikely to happen and there has been no loss of life in the UK from reservoir flooding since 1925. The Environment Agency is the enforcement authority and ensures that reservoirs are inspected regularly, and essential safety work is carried out.
- 5.7.2 The Long-Term Flood Risk Assessment (Flood Risk from Reservoirs) map shows that the site is at a low risk of Reservoir flooding.

5.8 Summary

5.8.1 Below is a summary of the flood risks associated with the development site.

Source	Flood Risk	Likely Impacts	Remarks
Tidal	Low	Low	Site not affected by Tidal Flood water.
Fluvial (Watercourse)	Low	Low	Site located in Low-Risk Flood Zone 1 from Fluvial Flooding.
Surface Water (Overland Flood Flow)	Low-Medium	Low	Site is shown at medium risk, though based on old LIDAR mapping. New raised buildings and drainage will mitigate.
Sewers	Low	Low	Public sewers located outside of the development site. Low risk from both private and adopted drainage.
Groundwater	Low	Low	No indication through SFRA and online mapping that site at risk of groundwater flooding. Building elevated above the existing ground levels and adjoining highways.
Artificial Sources	Low	Low	No Artificial sources in close proximity.

Figure 6 Flood Risk Summary

6.0 Outline Drainage Strategy

6.1 External Consultation

- 6.1.1 Marston & Grundy have been in contact with United Utilities via a predevelopment drainage enquiry for the development site. Their considered response was received on the 6th November 2023 and advised that evidence should be provided that the SuDS Hierarchy has been assessed. Should all higher SuDS options be discounted then connection would be acceptable to the combined public sewer at a pass forward rate as agreed with the LLFA and in line with the local SFRA guidance, i.e. in this case a 50% reduction in existing brownfield rates. Refer to Appendix F for details.
- 6.1.2 The Canal & River Trust (CRT) were also consulted. They have advised that the Ashton Canal is nearing capacity and discharges would not usually be permitted directly above or below locks where discharges and flow rates are heavily restricted, and thus unlikely to be able to accept any further inflows. Refer to Appendix G for details
- 6.1.3 Notwithstanding the current capacity of the canal, the Grade II listed locks are located immediately to the South East corner of the existing bank building, resulting in insufficient head for a gravity connection below the existing building (beyond the locks) and c.3-4m height difference between ground level and canal with a towpath in between and other site constraints, renders a connection to the north of the bank to enable structure to the north of the building impractical and excessively costly. For these reasons a connection to the canal has been discounted.



Figure 7 CRT Constraints Map

6.2 Existing Drainage

As discussed in Section 5, the UU sewer records have been reviewed and confirm that there is a 225mm diameter combined sewer flowing west within Ashton New Road. The current bank and car park discharge unrestricted to this sewer via a 150mm diameter drain. No surface water sewers have been identified in close proximity.

6.3 Existing Runoff

- 6.3.1 The existing site is comprised of the former bank building and tarmac parking areas, thus considered to be Brownfield for drainage purposes. Figure 8 below defines the existing Brownfield runoff rate based on the site area of 0.088ha based on the modified rational method.

Existing Impermeable Area (ha)	Brownfield Rates
0.088	Q₁ (30mm/hr) 7.3 l/s Q₃₀ (65mm/hr) 15.9 l/s Q₁₀₀ (95mm/hr) 23.2 l/s

Figure 8 Existing Brownfield Runoff Rate

6.4 Geology

- 6.4.1 A detailed Phase 2 Site Investigation has been undertaken. The findings are circa 3m of Made Ground comprising silty friable clay, over firm silty clay to depth. In light of these findings it is considered that infiltration would not be suitable.

6.5 Hydrological Assessment

- 6.5.1 As discussed earlier in previous sections, The River Medlock is located some 800m to the north west of the site. The Ashton Canal abuts the site to the northeast of the site.

6.6 Sustainable Drainage Systems (SuDS) Assessment

6.6.1 SuDS Objectives

Sustainable drainage, developed in line with the ideals of sustainable development, is collectively referred to as Sustainable Drainage Systems (SuDS). At a particular site, these systems are designed both to manage the environmental risks resulting from the urban runoff and to contribute wherever possible to environmental enhancement. SuDS objectives are therefore to minimise the impacts from the development on the quantity and quality of the runoff and maximise amenity and biodiversity opportunities (CIRIA C753, 2015).

6.6.2 *SuDS Design Themes*

The 'Management Train Approach' should be central to the surface water drainage strategy of the proposed site. The main objective is treatment and control of runoff as near to the source as possible protecting downstream habitats and further enhancing the amenity value of the site. This concept uses a hierarchy of drainage techniques to incrementally reduce pollution, flow rates and volumes of storm water discharge from the site, and is as follows:

- i. **Prevention** – The use of good site design and housekeeping measures to prevent runoff and pollution and includes the use of rainwater reuse / harvesting.
- ii. **Source Controls** – Control of runoff at source or as close to source as possible (e.g. soakaways, green roofs, pervious pavements).
- iii. **Site Control** – Management of water in a local area and can include below ground storage / attenuation, detention basins, large infiltration devices.
- iv. **Regional Control** – Management of water from a site or various sites and can include wetlands and balancing ponds.

6.6.3 *SuDS Site Constraints*

SuDS techniques are suitable for all sites; therefore, an assessment of the existing site is required so that SuDS limitations can be determined.

- *Land Use Characteristics:* The small size and type of development allows a potential range of source control and site control SuDS devices to be considered.
- *Site Characteristics:* Cohesive underlying geology means infiltration is not a viable means of surface water discharge.
- *Catchment Characteristics:* The site is currently classed as 'Brownfield' and the discharge rate from the site will need to be include a 50% reduction in the existing brownfield rates to comply with MCC policy for the area. But to also include a minimum sized orifice plate to prevent blockage and so a maximum flow rate of 5l/s.
- *Environmental and Amenity Performance:* The inclusion of SuDS within the overall development is a key driver in providing both amenity and habitat creation. All types of SUDs including where possible Ponds, swales and both wet and dry basins should be considered and blended into the landscaping zone, if possible. Safety to all future users is paramount and so best practice guidance will be incorporated so that these devices blend into the surrounding without the need for significant safety precautions. Maintenance plans will be prepared for all SuDS devices that are included.

6.6.4 *SuDS Methods*

Figure 9 and 10 on the following pages provide an assessment of various above and below ground SuDS methods that can provide water quality treatment and management of flows to reduce runoff rates and volumes and whether they can be suitably incorporated at this development site. The purpose of this assessment is to

set out options to be considered at the planning stage with consideration to time constraints, viability and lifetime maintenance of the commercial development.

Method	Comment	Suitability for Development
Green Roofs	Can be used on suitable low-rise buildings to provide retention, attenuation and treatment of rainwater, and promotes evaporation and local biodiversity.	<u><i>Not suitable:</i></u> Proposed roof configuration would not enable green roofs to be incorporated.
Water Butts	Plastic tanks placed at the base of rainwater down pipes to collect rainwater runoff from the roof areas.	<u><i>Not Suitable:</i></u> Not suitable for a training facility with limited end use.
Rainwater Harvesting	Rainwater harvesting reduces the total runoff volume from the developed site and reduces treated water consumption.	<u><i>Not Suitable:</i></u> - Additional costs of installation would have severe effect on viability of the development. - Running and maintenance costs would not be acceptable to our client and future occupiers. - The ability to restrict peak flow rates and short-term peak volumes is non-existent where a critical storm event occurs.

Infiltration Options	Reduces total run off volume from the development.	<u>Not Suitable:</u> Site Investigation has identified the underlying ground to be cohesive, thus precluding the use of infiltration.
Permeable Surfacing (Infiltration)	- Reduces total run off volume from the development. - Can be used to enhance water quality.	<u>Suitable:</u> Small areas of hard landscaping to be constructed in permeable surfacing.
Permeable Surfacing (Standard)	- Can be used to enhance quality of runoff water. - Sub-base provides 'source' storage and reduces the volume of storage downstream. - The storage can be created with selection of the stone fill or use of plastic box stems. - Impermeable membrane at base of construction to prevent impact on pavement stability.	<u>Suitable:</u> Small areas of hard landscaping to be constructed in permeable surfacing.
Swales, basins and ponds	- Provide areas for above ground surface runoff storage. - Swales also allow filtering of particulate matter, improving water quality	<u>Not suitable:</u> No space within the development area to include Green SuDS.
Bio-Retention	Collect and retain run-off to help improve water quality, prior to discharge in piped system on infiltration.	<u>Not suitable:</u> - Space constraints on site do not permit large above ground areas for flood storage. - No scope to reduce development area due to site viability.

Figure 9 Surface SuDS Methods

Method	Comment	Suitability for Development
Geocellular Storage	• Suitable for sites with insufficient space for basins etc. • Suitable for sites where topography prevents the use of open basins etc. • Can be very effective infiltration devices subject to ground conditions.	<u>Suitable:</u> • Subject to detailed design and drainage layout.
Large Diameter Pipes, Culverts or Tanks	• Suitable for sites with insufficient space for basins etc. • Provide a volume of below ground storage with a high void ratio and good man entry provision to allow for future maintenance and cleaning. • Generally, be suitable for adoption by the statutory water company (e.g. United Utilities).	<u>Not suitable:</u> • More suited to large residential developments.

Figure 10 Sub-Surface SuDS Methods

6.6.5 SuDS Hierarchal Approach

Based on the SuDS assessment in Figure 9 and 10, plus an assessment of the local site conditions, the SuDS hierarchal approach for discharge of surface water at the development site is considered in greater detail below:

Method	Suitability	Suitability for Development
Infiltration to Ground	No	Cohesive underlying geology precludes the use of infiltration.
Connection to Watercourse	No	CRT have advised that there is limited capacity within the adjacent Ashton Canal, plus constraints associated with constructing new outfall in listed docks.
Connection to Surface Water Sewer	No	No surface water sewers in close proximity.
Connection to a Combined Sewer	Yes	Reuse existing connection to existing combined sewer at restricted rates.

Figure 11 SuDS Hierarchal Approach

6.6.6 *SuDS Design Philosophy*

SuDS assessment and hierarchal approach discussed in Figure 8, 9 and 10 above has defined the overall SuDS strategy. Thus, the SuDS philosophy for the development site is the promotion of Source Control in the form of permeable surfacing and Site Control techniques with discharge to the combined water sewer at restricted rates, up to and including the 100-year runoff rate plus an allowance for climate change.

The following design philosophy is proposed:

- Surface water treatment using the 'Management Train' approach to remove and isolate contamination at all SuDS facilities prior to conveyance to the existing drainage infrastructure.
- Restrict new development runoff peak flow rates to a peak rate of 5.0l/s.
- Source control in the form of permeable surfacing.
- Site control in the form of below ground attenuation with flow control.
- Aim to limit where possible the impermeable fraction of development.

6.7 Climate Change

6.7.1 In May 2022, the Environment Agency released updated climate change allowances for peak rainfall intensities, which should be applied to new developments. Rather than nationwide allowances, each area will have its own peak rainfall allowances. In the case of the Manchester area, this is the Irwell Management Catchment peak rainfall allowances.

6.7.2 Based on the nature of the development, a lifespan in excess of 70 years is anticipated. Therefore, the potential climate change allowance for the 2100's would be 45% for the Upper End Allowance, Less Vulnerable development type, with this peak rainfall intensity included in calculations.

6.8 Outline Surface Water Drainage Strategy

6.8.1 The general principal of the surface water drainage strategy is to collect the runoff from the roof of the new building, and external areas of the new development and direct it to a new below ground surface water drainage network. This will then outfall to the combined water sewer via the existing private surface water drain at a peak rate of 5.0l/s. This is considered to be the minimum rate to prevent long term blockage and provides a significant reduction in the existing unrestricted peak discharge rates. Note the reconfigured car parking area will continue to drain to the existing wider Campus drainage network and not form part of the new attenuation measures.

6.8.2 The proposed drainage layout for the new development site has been designed in accordance with BS EN 752: 2008 and Building Regulations Part H guidance. This is to indicate no surcharge for the 2-year storm event and no flooding for up to the 30-year storm event.

6.8.3 Site control SuDS in the form of a below ground geocellular tank will act as the storage measure upstream of the flow restricting device.

6.8.4 A hydraulic network has been modelled and simulated in the Microdrainage design software to define the outline pipes size and attenuation volume. This outline surface water network can be found on the drainage strategy drawing in Appendix D which should be read in conjunction with the hydraulic calculations in Appendix E. It is noted that these rates and volumes are preliminary for this outline assessment and are likely to alter at detailed design stage when more site-specific information is made available.

6.9 Pollution Control

6.9.1 Runoff from roofs is generally considered to be clean and will be discharged directly into the surface water network. Silt and debris will also be prevented from entering the drainage system by the use of trapped gullies, silt boxes and a catchpit chamber.

6.10 Maintenance

6.10.1 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.

6.10.2 There are three types of maintenance activities associated with surface water drainage systems. The SuDS Manual, CIRIA C753, defines these as:

- Regular Maintenance – *'basic tasks undertaken on a frequent and predictable schedule' including vegetation management, litter and debris removal, and inspections.'*
- Occasional Maintenance – *'tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (sediment removal is an example).'*
- Remedial Maintenance – *'intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised by good design. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, and as such timings are difficult to predict.'*

6.10.3 Specific maintenance needs should be monitored, and maintenance schedules adjusted to suit the location and condition of the drainage feature in question.

Operation and Maintenance Activity	SuDS Component		
	Piped Network / Inspection Chambers	Attenuation Tank	Flow Controls
Regular Maintenance			
Inspection	■	■	■
Litter and debris removal	■	■	■
Grass cutting		■	
Weed and invasive plant control		□	
Shrub management (including pruning)		□	□
Shoreline vegetation management		□	
Aquatic vegetation management		□	
Occasional Maintenance			
Sediment management ¹	■	■	■
Vegetation replacement		□	□
Remedial Maintenance			
Structure rehabilitation / repair	□	□	□
Infiltration surface reconditioning			
■ Will be required □ May be required ¹ Sediment should be collected and managed in pre-treatment systems, upstream of the main device.			

Figure 12 Extract from *The SuDS Manual* Table 32.1: Typical key SuDS components operation and maintenance activities

6.10.4 Piped Networks, Inspection, Manhole and Catchpit Chambers

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 are proprietary products, and the materials can vary across the site and as such where used the manufacture's recommendations should be followed.

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 are 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	Typical Frequency
Regular Maintenance	Inspect and identify any features that are not operating correctly. If required, take remedial action.	Monthly for three months, then six monthly
	Debris removal from catchment surface / gratings (where may cause risks to performance).	Monthly (and after large storms)
	Remove sediment from trapped sumps, manholes and catchpits.	Annually or as required
Remedial Maintenance	Repair / rehabilitation of gratings, inlets and outlets.	As required
Monitoring	Inspect / check all gratings, trapped sumps, manholes and catchpits to ensure that they are in good condition and operating as designed.	Annually and after large storm events
Structure Rehabilitation / Repair	Regular Maintenance and Monitoring to identify if repair and / or replacement of features or pipework is required.	As required

Figure 13 Operation and Maintenance Requirements of Piped Networks and Inspection Chambers

6.10.5 Attenuation Tanks

The attenuation tank is currently specified as a geocellular unit, which are wrapped in an impermeable membrane to allow the water to attenuate within the crates.

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

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

Regular inspection and maintenance are 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/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed. Survey inside of the tank for sediment build-up and remove if necessary.	Annually
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
	For systems where rainfall infiltrates into the tank from above, check the surface of filter for blockages by sediment, algae or other matter; remove and replace surface infiltration medium as required.	Annually.
	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.

Figure 14 Operation and Maintenance Requirements of Piped Networks and Inspection Chambers

6.10.6 Flow Control Units

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

The flow control is specified as Hydro-brake and is a proprietary product; therefore, manufacturer's recommendations should also be taken into 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	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.

Figure 15 Operation and Maintenance Requirements for Flow Controls

6.11 Foul Water Drainage

6.11.1 Foul drainage generated from the new development will merge with the controlled surface water discharge and outfall to the combined sewer to the north west of the site via the existing connection.

6.11.2 The proposed private drainage layout for the new development site will be designed in accordance with BS EN 752: 2008 and Building Regulations Part H guidance.

6.11.3 An indicative foul water drainage layout can be found on the drawing in Appendix D.

7.0 Management Measures, Off Site Impacts & Residual Risk

7.1 Flood Risk Management Measures

- 7.1.1 The surface water drainage strategy for the new development site will be to limit the surface water runoff to a peak rate of 5l/s prior to discharge into the combined sewer. Therefore, the development proposals do not increase flood risk to surrounding areas.
- 7.1.2 Attenuation measures will be incorporated in the form of below ground geocellular crates.
- 7.1.3 The use of SUDS in the form of Site Control measures will help to minimise the flood risk impact to the surrounding sewers.
- 7.1.4 Should any flooding occur from the new drains it will be directed away from the new training facility building to the external parking and landscaped areas.

7.2 Offsite Impacts

- 7.2.1 The development of the site does not impair the hydraulic continuity of any watercourse and the current “local hydraulics” of distributing watercourses / outfalls.
- 7.2.2 The Development footprint does not cross or cover any existing or declared future catchment flood defences. Consequently, the Applicant does not propose to augment or compromise the current catchment defences.
- 7.2.3 By reducing the pre-development peak runoff at its point of discharge into the combined water sewer by the inclusion of SuDS, this will reduce surface water flooding impact onto the downstream catchment.
- 7.2.4 As there is no flood displacement or increased rate of runoff as part of this proposal into the adjacent sewers, the proposed development will therefore not increase flood risk onto its locality.

7.3 Residual Risk

- 7.3.1 With careful design of the drainage elements as described above there will be no residual flood-related risks that will remain after the development has been completed.

Appendix A – Architects Drawings



KEY

SOFT LANDSCAPING

- Existing trees/hedge to be retained
Subject to Cheshire Woodlands arboricultural report
- Existing trees/hedge to be removed
Subject to Cheshire Woodlands arboricultural report
All materials to be retained on site & used as topsoil plus beneath existing & proposed woodland tree belts
- Proposed tree - Coniferous
14-16cm girth, 400-500cm high,
2m clear stem, planted in min 900mm deep imported topsoil with underground anchor system
Refer to SLD dwg 407-81
- Proposed tree - Coniferous
300-400cm high, 2m clear stem, planted in min 900mm deep imported topsoil with underground anchor system
Refer to SLD dwg 407-81
- Proposed tree - Deciduous
Heavy Standard Tree, 12-14cm girth, 350-425cm high,
2m clear stem, planted in min 900mm deep imported topsoil with underground anchor system
Refer to SLD dwg 407-81
- Proposed tree - Deciduous
Heavy Standard Tree, 12-14cm girth, 350-425cm high,
2m clear stem with underground anchor system set in ornamental gravel & metal tree ring
Refer to SLD dwg 407-81
- Proposed tree - Deciduous
Standard Tree, 10-12cm girth, 300-350cm high, 2m clear stem, planted in min 900mm deep imported topsoil with underground anchor system
Refer to SLD dwg 407-81
- Proposed tree - Half Standard tree, min 150cm high

- Grass
Amenity turf/ grass seed OR Low tussock grass mix on minimum 100mm imported topsoil
- Hedge
2.0m high hedge planted @ 1.3 per m, planted in min 900mm deep imported topsoil, with 75mm ornamental bark mulch dressing
Native evergreen species
- Native hedge mix
Whips/ transparent container grown plants planted in double staggered rows (rows 500mm apart), 6 per lin. m with suitable spiral guards
- Ornamental shrub planting
A mix of evergreen/deciduous/ grasses/ perennials & shrubs to provide habitat for birds and insects and for striking year-round display (plants supplied in 3-4L pots planted @ 3-4 m² in 450mm imported topsoil with 50mm ornamental bark mulch dressing)
- Wildflower meadow
Emongate Seeds EM3 Special General Purpose Wild Flowers sown at 4g/m² EMO Standard General Purpose Wild Flower sown at 4g/m² or similar approved
- Earthworks
To be constructed with existing excavated soils
Tree planting/ hedge areas - 500-1000mm deep imported topsoil capping layer
- Wildflower areas - 100mm deep imported Meadowmat Low Fertility Soil

HARD LANDSCAPING

- Pedestrian surfacing A- Refer to SLD dwg 407-72
Hot rolled asphalt surfacing to pedestrian footpaths
PCC pin kerbs edge restraint used adjacent to soft landscaping or other surface
- All manhole covers to be recessed & infilled with hot rolled asphalt to match adjacent surfacing
- Pedestrian surfacing - Refer to SLD dwg 407-72
Hot rolled asphalt surfacing to pedestrian footpaths
PCC pin kerbs edge restraint used adjacent to soft landscaping or other surface
- All manhole covers to be recessed & infilled with hot rolled asphalt to match adjacent surfacing
- Concrete surfacing - Bin store & chemical store base
Refer to SLD dwg 407-72
To engineers details & specifications
PCC pin kerbs edge restraint used adjacent to soft landscaping or other surface
- Vehicular hard surfacing - Refer to SLD dwg 407-72
Hot rolled asphalt to engineers details & specifications
PCC kerbs, 100mm upstand, drop kerbs to be used at crossing points
- Artificial grass - Refer to SLD dwg 407-72
- Existing vehicular entrance reinstated as footpath to MCC adoptable standards

BOUNDARIES & STRUCTURES

- Existing boundary treatment to be retained
- Welded mesh security fence - 2.4m high
Refer to SLD dwg 407-81
Bee Post as supplied by Nichie Environmental or similar approved
- Posts: 80 x 80mm patented rolled section, hot dip galvanised after manufacture & polyester powder-coated
- Fencing: 80 cup square bolt with permicone nut, galvanised
- Max post centres: 2.5m
- Self Posts: Self posts to holes 300mm dia x 800mm deep depending on fence height & to be designed by engineer. Flashed not less than half the depth of the concrete
- Bottom of fencing to be: max 40mm above final ground level
- Other requirements: PPC Colours Green (RAL 6005)
- Automated vehicular/ pedestrian gates
All gates to be security rated LPS 1175 Category 2
Colours to match adjacent fence panels
- Blind-holding vehicular gates 7.5m wide x 2.4m high
Single leaf pedestrian gates 1.5m wide x 2.4m high as supplied by CLD or similar approved
- Access control: TBC
Locking mechanism: TBC
- Wall - Access ramp & steps
In situ concrete or pre-cast concrete retaining wall to engineers details & specifications
- Handrail: to match existing fixed to concrete wall/ foundations to engineers specifications

FURNITURE

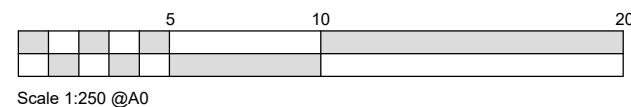
- Raised planting bed
Refer to SLD dwg 407-82
Bricks concrete or pre-cast concrete units, 200mm high
- Ecological habitat furniture A
Refer to SLD dwg 407-88
Bee Post as supplied by Nichie Environmental or similar approved
- Ecological habitat furniture C
Refer to SLD dwg 407-89
Habitat Letters M.C.V.F.C as supplied by Green Earth Habitats or similar approved
- Log pile
Constructed with felled tree timbers
Stack logs of differing lengths (max500mm) with base layer buried in ground
- Bird box
Beaumonts Maxi Bat Box, fixed to building elevation min. height 4m above canal topsoil
- Bird box
Vivara Pro Woodstone House Sparrow Nest Box, fixed to building elevation min. height 4m above canal topsoil
- Litter Bin
Refer to SLD dwg 407-86
Glasdon Future Litter Bin, 1056 (h) x 551 (w) x 551mm (d), Black colour, Club logo graphics, External Base Weight Rings, metal tree as supplied by Glasdon Group Limited
- Boot cleaner
Refer to SLD dwg 407-84
Compressed air shoe cleaning system, Air-Eze Bootboy, black colour finish, Club logo graphics
- Bin store
Timber cladding to all elevations, metal profile roof finish set on concrete base to contractors specifications & design
- Electricity cabinet
Refer to SLD dwg 407-87
Roadside cabinet, Chromeweld material, finished in RAL 6005 Moss Green colour, 1000mm (h) x 1300mm (w) x 600mm (d) product ref: RC1/130 as supplied by WEC Group Ltd or similar approved set on concrete plinth

ELECTRICAL

- Wall mounted step light LED luminare
Refer to SLD dwg 407-82
- Wall mounted LED luminare with 3hr emergency battery
- Pole light
- BL
- 2 point electric vehicle charging point
- Existing lighting column
New CCTV camera to be fixed as per consultant specifications

MISCELLANEOUS

- Existing contour retained
- Proposed contour
- Proposed bank
- Existing level
- Proposed level



D	Additional replacement trees planting added	KAS	1 Nov24
C	Lighting plan added, revised status updated	KAS	06 Oct24
B	Lighting plan added, revised status updated	KAS	06 Oct24
A	Lighting plan added, revised status updated	KAS	06 Oct24
Rev	Description	Rev	Date

saville LANDSCAPE DESIGN
Hatherlow House Remley Stockport Cheshire SK6 3DY
T: 0161 498 7333
E: info@savillelandscape.co.uk
W: www.savillelandscape.co.uk

CLIENT

MFCF

PROJECT TITLE

Women's First Team

DRAWING TITLE

Landscape VE

STAGE 4

STAGE 4

Scale

1:250

Drawn

A0

Checked

KAS

Date

Nov24

PROJECT NO.

407

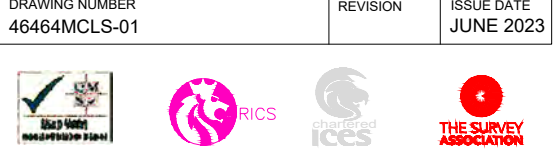
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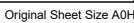
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REV.

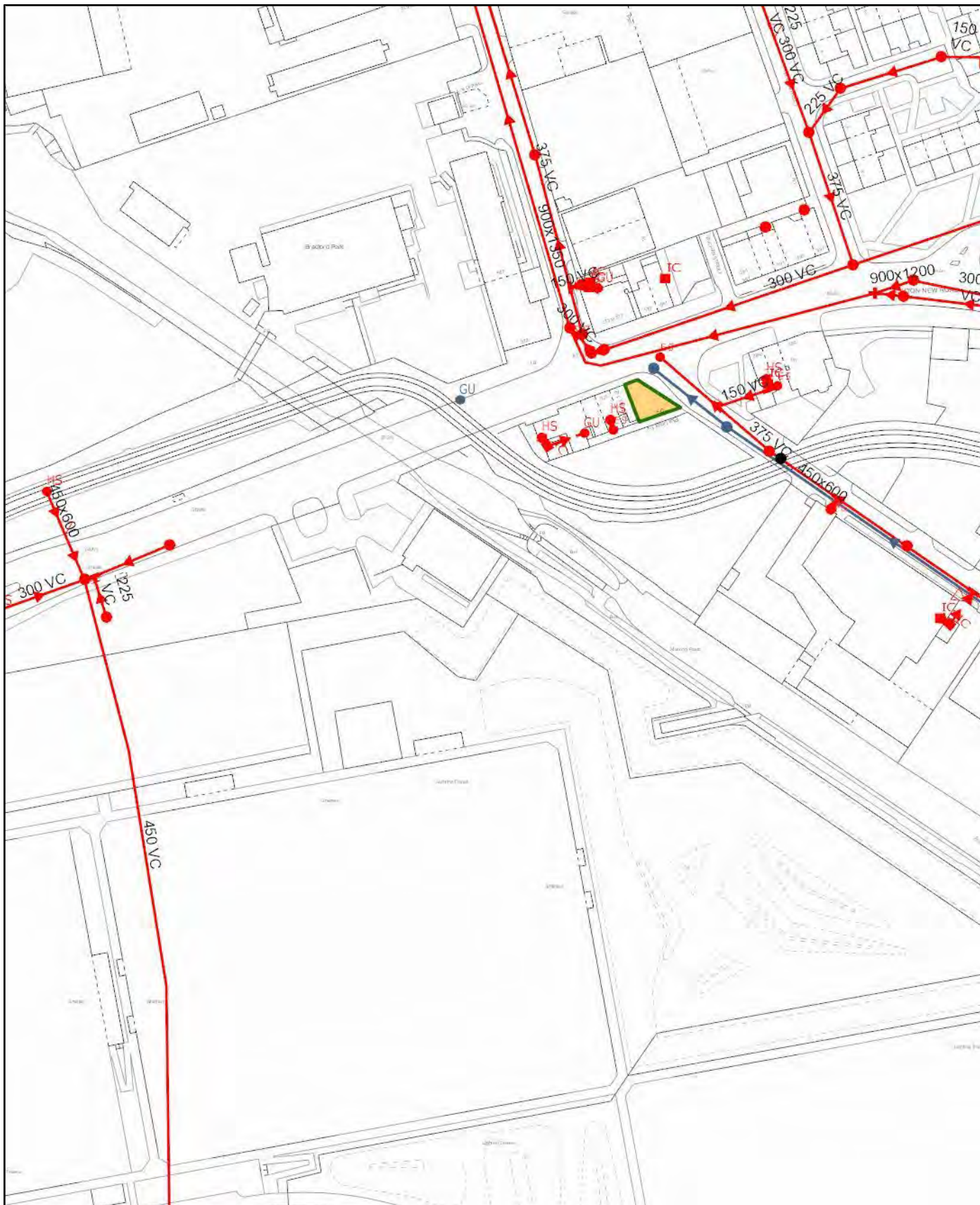
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Appendix B – Topographical Survey





Appendix C – United Utilities Sewer Records



Scale: 1:1690
Date: 26/07/2023

SEWER RECORDS



Address or Site Reference: MCFC
Printed by: Property Searches

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

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Appendix D – Marston & Grundy Drawings

FOUL WATER DRAINAGE STRATEGY

FOUL WATER GENERATED BY THE NEW DEVELOPMENT WILL CONNECT TO THE COMBINED PUBLIC SEWER VIA AN EXISTING PRIVATE CONNECTION.

SURFACE WATER DRAINAGE

CONSIDERATION HAS BEEN GIVEN TO THE HIERARCHY OF DRAINAGE OPTIONS FOR THE SITE AS FOLLOWS:

- DISCHARGE INTO GROUND - ADOPTED FOR SOFT LANDSCAPING AND SMALL AREAS OF HARD LANDSCAPING, BUT UNDERLYING CLAY SUBSTRATA WOULD MAKE INFILTRATION BASED OPTIONS FOR LARGER AREAS UNSUITABLE.
- DISCHARGE TO SURFACE WATER BODY - CRT HAVE ADVISED THAT THERE IS NO CAPACITY IN THE ADJACENT ASHTON CANAL. NO OTHER WATERCOURSE IN CLOSE PROXIMITY.
- DISCHARGE TO SURFACE WATER SEWER, HIGHWAY DRAIN OR OTHER DRAINAGE SYSTEM - NO SURFACE WATER SEWER IN CLOSE PROXIMITY.
- DISCHARGE TO COMBINED WATER SEWER - CONNECT TO EXISTING COMBINED WATER SEWER VIA THE EXISTING PRIVATE CONNECTION AT RESTRICTED RATES.

THE PROPOSAL IS TO DISCHARGE SURFACE WATER FROM THE NEW DEVELOPMENT AT A RESTRICTED OUTFLOW OF 50/s TO THE ADJACENT COMBINED SEWER VIA AN EXISTING PRIVATE DRAIN. ONLINE GEOCELLULAR TANKS TO RETAIN THE PEAK FLOWS.

SUDS TO ENCOMPASS:

- PERMEABLE SURFACING
- ATTENUATION TANK
- FLOW CONTROL

NOTE THE HYDRAULIC MODEL AND PIPE INFORMATION SHOWN ON THIS DRAWING IS BASED ON ANTICIPATED GROUND LEVELS AND SUBJECT TO CHANGE AT DETAILED DESIGN STAGE.

NOTES

This drawing is copyright and owned by Marston and Grundy LLP, and is for use on this site only unless contractually stated otherwise.

DO NOT SCALE this drawing (printed or electronic versions). Contractors must check all dimensions from site.

All other design team elements, where indicated, have been imported from the consultant's drawings/model and reference should be made to the individual consultant's drawings for exact setting out, size and type of component.

KEY

- APPLICATION BOUNDARY
- EXISTING PUBLIC COMBINED SEWER
- EXISTING PRIVATE COMBINED WATER DRAINAGE
- EXISTING PRIVATE SURFACE WATER DRAINAGE
- EXISTING PRIVATE DRAINAGE TO BE ABANDONED
- PROPOSED FOUL WATER DRAINAGE
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED COMBINED WATER DRAINAGE
- PROPOSED PERMEABLE SURFACING
- PROPOSED GAS DIVERSION ROUTE AND EASEMENT - T.B.C BY OTHERS.
- PROPOSED OVERLAND FLOW ROUTES
- 1.5m NO BUILD ZONE FOR DRAINAGE MANHOLES OR INSPECTION CHAMBERS

PROPOSED GAS PIPE DIVERSION ROUTE AND EASEMENT SHOWN INDICATIVE ONLY, FINAL SETTING OUT BY OTHERS. EMAIL CONFIRMATION RECEIVED (17.05.24) FROM GAS SUPPLIER (CADENT) THAT PROPOSED DRAINAGE CAN BE LOCATED WITHIN EASEMENT ZONE

LOCATIONS, DEPTH AND SIZE OF ALL EXISTING DRAINAGE TBC PRIOR TO WORKS COMMENCING

ALL PIPEWORK TO BE 100Ø UNLESS NOTED OTHERWISE

FW PIPES TO BE LAID AT MAX GRADIENT OF 1:80.
SW PIPES TO BE LAID AT MAX GRADIENT OF 1:100.

PROVIDE PROPRIETARY ROOT BARRIER PROTECTION FOR ALL DRAINAGE BELOW SOFT LANDSCAPING AREAS.

C3	UPDATED TO SUIT VE CHANGES	AMT	10.10.24	PK
C2	SEWER ANNOTATED ON KEY	AMT	21.06.24	PK
C1	CONSTRUCTION ISSUE	AMT	10.05.24	PK
P4	STAGE 4 ISSUE	AMT	08.04.24	PK
P3	CLIMATE INCREASED TO 45%	PG	21.03.24	PK
P2	LANDSCAPE PLAN UPDATED	PG	12.12.23	PK
P1	PRELIMINARY ISSUE	PG	13.11.23	PK
Rev	Description	By	Date	CHK'd

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Client
MCFC

Project
**MCWFC FACILITY,
ETIHAD CAMPUS**

Drawing
**BELOW GROUND DRAINAGE
STRATEGY PLAN**

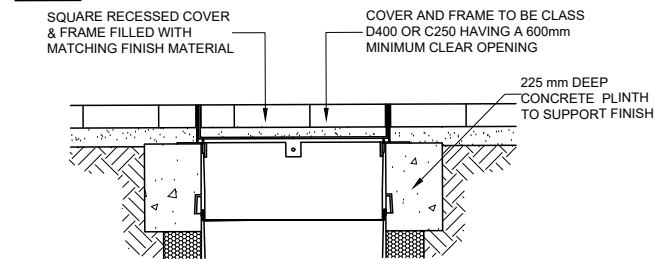
Purpose of Issue
CONSTRUCTION

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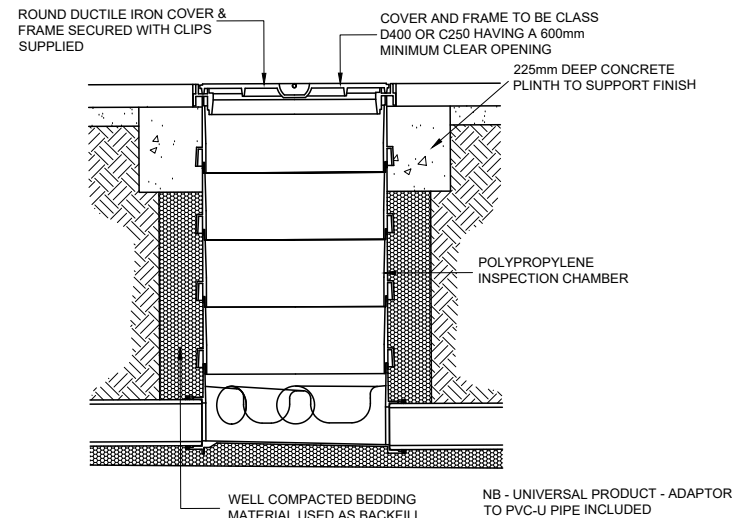
Drawing Identifier	BS1192 Compliant
project	origin
zone	level
type	role
number	revision
MCW-MaG-ZZ-XX-DR-C-200	C3

- LANDSCAPE LAYOUT TAKEN FROM SAVILLE LANDSCAPE DESIGN DWG 407-70_Rev B.
- RWP LOCATIONS TAKEN FROM BOWKER SADLER ARCHITECTS DWG 22-053-203_Rev A.
- POP UP LOCATIONS TAKEN FROM SVM DWG 230565-SVM-ZZ-00-DR-M-1400_Rev T1.

SITED IN DRIVEWAYS / HARD LANDSCAPED AREAS WITH RECESSED COVER

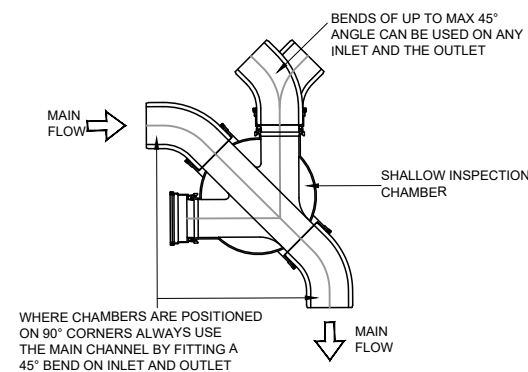


SITED IN DRIVEWAYS / HARD LANDSCAPED AREAS
WITH STANDARD ROUND COVER

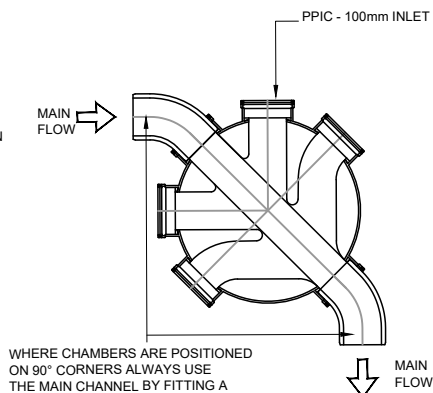


POLYPROPYLENE INSPECTION CHAMBER INSTALLATION DETAIL

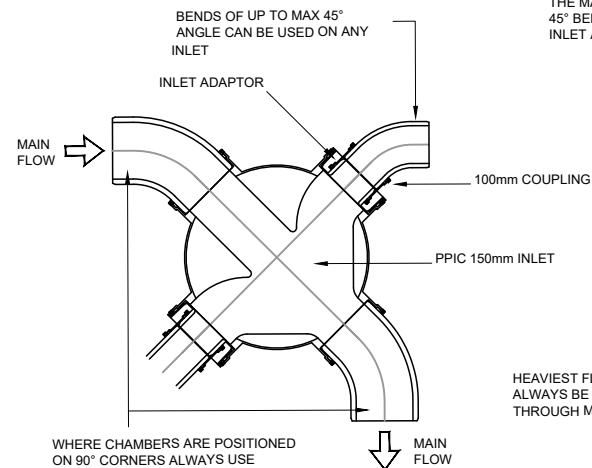
(475dia. UP TO 1.2m DEPTH)



WHERE CHAMBERS ARE POSITIONED
ON 90° CORNERS ALWAYS USE
THE MAIN CHANNEL BY FITTING A
45° BEND ON INLET AND OUTLET



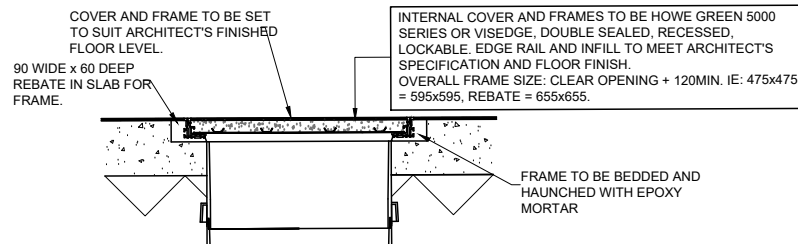
WHERE CHAMBERS ARE POSITIONED ON 90° CORNERS ALWAYS USE THE MAIN CHANNEL BY FITTING A 45° BEND INLET AND OUTLET INLET AND OUTLET



WHERE CHAMBERS ARE POSITIONED
ON 90° CORNERS ALWAYS USE
THE MAIN CHANNEL BY FITTING A
45° BEND ON INLET AND OUTLET

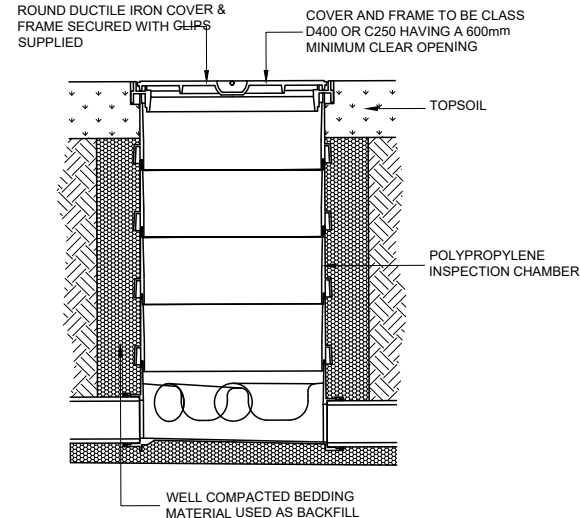
TYPICAL MINI ACCESS CHAMBER / PPIC INSTALLATION DETAIL

INTERNALLY SITED IN CONCRETE FLOOR SLAB



INTERNAL COVER AND FRAMES TO BE HOWE GREEN 5000
SERIES OR VISDEGD, DOUBLE SEALED, RECESSED,
LOCKABLE, EDGE RAIL AND INFILL TO MEET ARCHITECT'S
SPECIFICATION AND FLOOR FINISH.
OVERALL FRAME SIZE: CLEAR OPENING + 120MIN. IE: 475x475
= 595x595, REBATE = 655x655.

SITED IN SOFT LANDSCAPED AREAS WITH
STANDARD ROUND COVER



FRAME TO BE BEDDED AND HAUNCHED WITH M1 MORTAR.

GEN 3 MASS CONCRETE SURROUND.

HEAVY DUTY REINFORCED COVER AND REDUCING SLABS BEDDED WITH MORTAR. PROPRIETARY BITUMEN OR RESIN MASTIC SEALANT.

GEN 3 MASS CONCRETE SURROUND 150mm THICK.

BENCHING SLOPE TO BE NOT FLATTER THAN 1:30 AND NOT GREATER THAN 1:10.

CONSTRUCTION JOINT.

225 TO INVERT OF PIPE.

INVERTS FORMED GENERALLY USING CHANNEL PIPES.

600mm MINIMUM CLEAR OPENING TO COVER AND FRAME

875 (MAX.)

SEE TABLE

500 (MIN.)

900 (MIN.)

225 (MIN.)

75mm (MIN.)

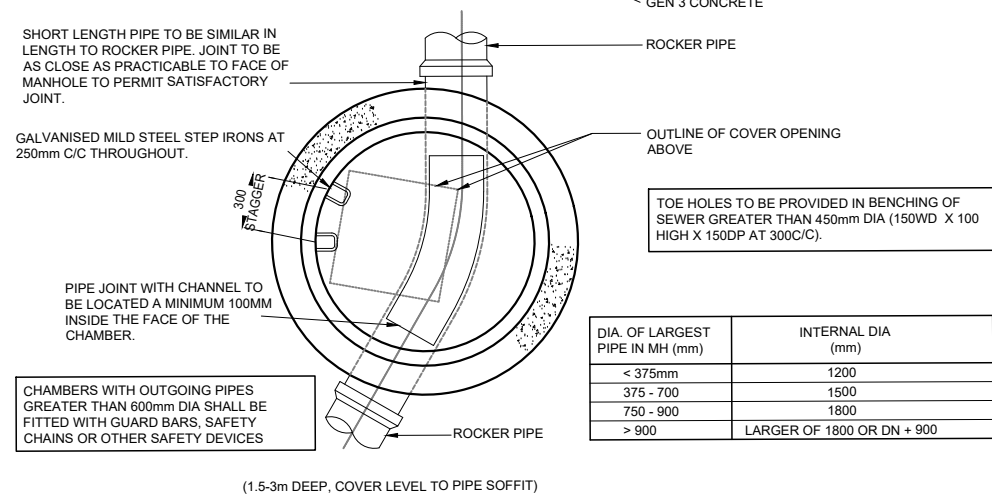
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CLASS B ENGINEERING OR SPECIAL PURPOSE CONCRETE BRICKWORK 4 COURSES (MAX.) 2 COURSES (MIN.) AND OR PRE-CAST CONCRETE COVER FRAME SEATING RINGS

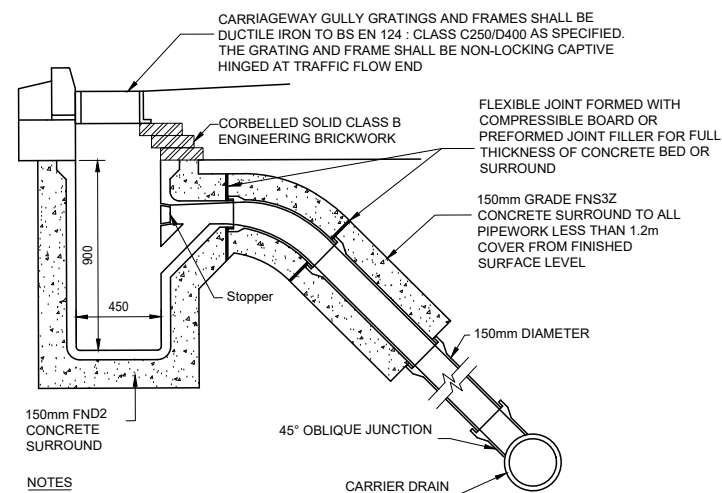
PRE-CAST CONCRETE CHAMBER SECTIONS TO BE BEDDED WITH MORTAR, PROPRIETARY BITUMEN OR RESIN MASTIC SEALANT

HIGH STRENGTH CONCRETE TOPPING TO BE BROUGHT UP TO A DENSE SMOOTH FACE NEATLY SHAPED AND FINISHED TO ALL BRANCH CONNECTIONS (MINIMUM THICKNESS 20mm).

GEN 3 MASS CONCRETE



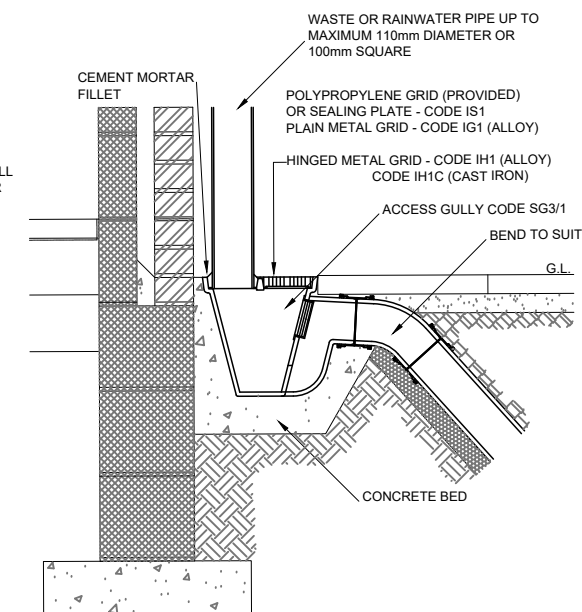
MANHOLE TYPE B



NOTES

1. GULLY POT TO BE 95 LITRES MIN CAPACITY
2. MAXIMUM TRENCH WIDTH FOR 150mm GULLY LEAD IS 600mm
NUMBER OF BENDS MAY VARY DUE TO SITE DIFFERENCES.
3. CONCRETE SURROUND TO PIPES SHALL ALWAYS FINISH AT A JOINT

GULLY DETAIL WITH CONNECTION TO CARRIER DRAIN



ACCESS GULLY CONNECTION DETAIL

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DIA. OF LARGEST PIPE IN MH (mm)	INTERNAL DIA (mm)
< 375mm	1200
375 - 700	1500
750 - 900	1800
> 900	LARGER OF 1800 OR DN + 900

C1	CONSTRUCTION ISSUE	AMT	10.05.24	PK
P1	STAGE 4 ISSUE	AMT	08.04.24	PK
Rev	Description	By	Date	Chk'd

Marston & Grundy LLP
Consulting Engineers
Priory House, Ellesmere Ave
Marple, Stockport, Cheshire, SK6 7AN
Telephone: 0161 427 7231
Email: mail@marstonandgrundy.com

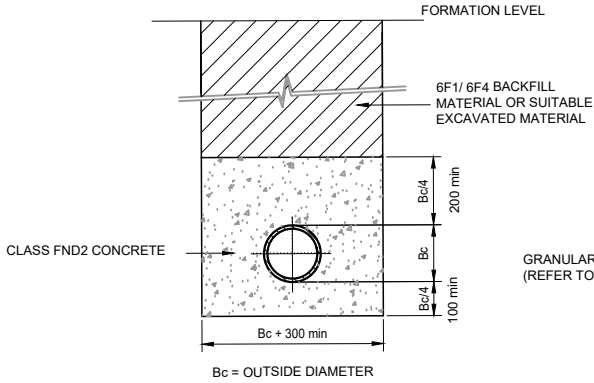
Client
MCFC

Project
MCWFC FACILITY
PHASE 1

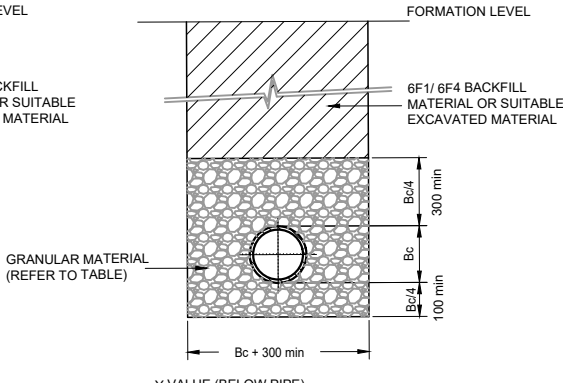
DRAINAGE DETAILS SHEET 1

Purpose of Issue
CONSTRUCTION

Project No. 13636	Scale @ A1 NTS	Date Apr 24	Drawn AMT	Checked PK
Drawing Identifier project origin zone level type role number MCW-MaG-ZZ-XX-DR-C-201				Revision C1

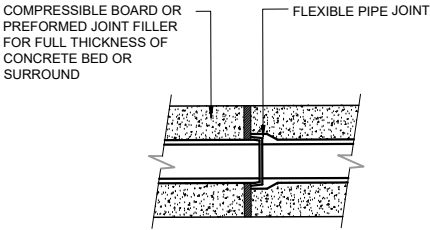


CLASS Z BEDDING DETAIL



CLASS S BEDDING DETAIL

NB- WHERE DRAINAGE IS IN CLOSE PROXIMITY TO EXISTING OR PROPOSED LANDSCAPE PLANTING, THE GRANULAR BED AND SURROUND SHALL BE WRAPPED WITH A DOUBLE THICKNESS OF LOTRAK 1800 OR SIMILAR APPROVED.



JOINTS FOR CONCRETE SURROUND TO PIPES
(TO OCCUR AT EACH PIPE JOINT)

Pipe Ø	Joint thickness
< 450	18mm
450-1200	36mm
1200 >	54mm

COMPRESSIBLE FILLER TABLE

(BITUMEN IMPREGNATED INSULATING BOARD TO BS 1142: PART 3)

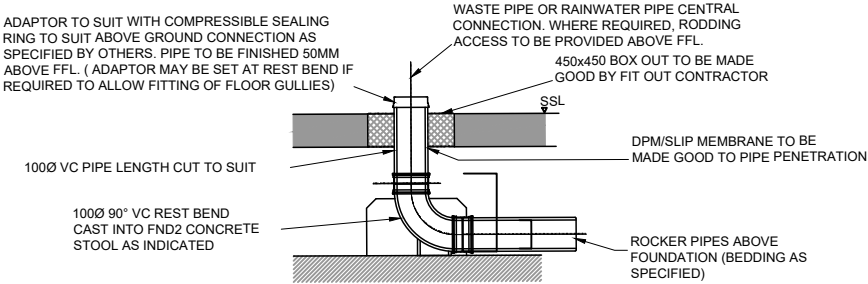
TRENCH WIDTHS	
PIPE I.D	OVERALL TRENCH WIDTH
100	550
150	600
225	700
300	850
375	1050
450	1150
525	1200
600	1350
675	1450
750	1500
825	1600
900	1900
1050	2100
1200	2300
1350	2500
1500	2700
1800	3100

BS EN 1610:1997 ANNEX B TABLE B.15 COARSE AGGREGATE - PIPE BEDDING							
SIEVE SIZE (mm)	PERCENTAGE BY MASS PASSING BS SIEVES FOR NOMINAL SIZES						
	GRADED AGGREGATE (mm)			SINGLE-SIZED AGGREGATE (mm)			
	40 to 5	20 to 5	14 to 5	40	20	14	10
50.0	100	-----	-----	100	-----	-----	-----
37.5	90 - 100	100	-----	85 - 100	100	-----	-----
20.0	35 - 70	90 - 100	100	0 - 25	85 - 100	100	-----
14.0	-----	-----	90 - 100	-----	-----	85 - 100	100
10.0	10 - 40	30 - 60	50 - 85	0 - 5	0 - 25	0 - 50	85 - 100
5.0	0 - 5	0 - 10	0 - 10	-----	0 - 5	0 - 10	0 - 25
2.36	-----	-----	-----	-----	-----	-----	0 - 5

RIGID PIPES BEDDING GRADING

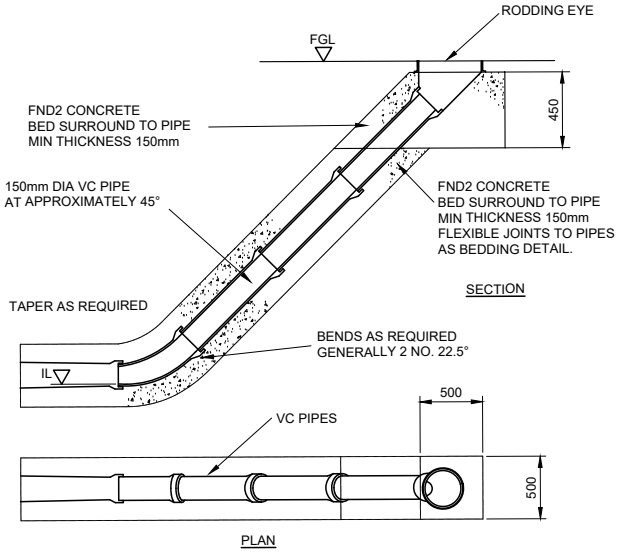
BASED ON BS EN 1610 : 1997 TABLE B.15
FOR RIGID PIPES THE BEDDING SHOULD BE SINGLE SIZE MATERIAL OR GRADED MATERIAL FROM 5mm UP TO A MAX SIZE OF 10mm FOR 100mm PIPES; 14mm FOR 150mm PIPES; 20mm FOR 225mm TO 600mm PIPES; 40mm FOR OVER 675mm PIPES

CHALK/LIMESTONE SHALL NOT BE USED AS BEDDING MATERIAL IN GROUND WHERE THE Ph <7

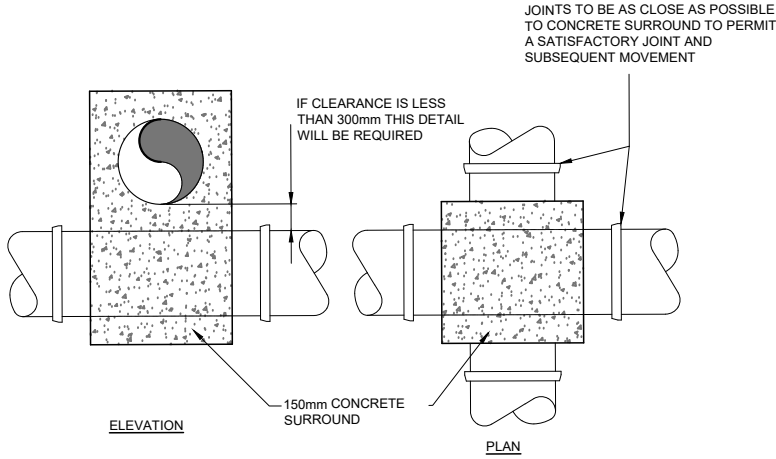


1000mm BELOW GROUND PIPE CONNECTION

NOTE: 1000mm 90° VC REST BEND INVERT LEVELS AS SPECIFIED.
BRANCH CONNECTIONS OFF FOUNDATIONS MAY BE SET DEEPER TO ALLOW FOR CONNECTION TO MAIN DRAIN RUN. ALTERNATIVELY, THE 1000mm 90° VC REST BEND MAY BE REPLACED BY 45°/30°/15° BENDS TO ALLOW FOR STEEP BRANCH CONNECTIONS.

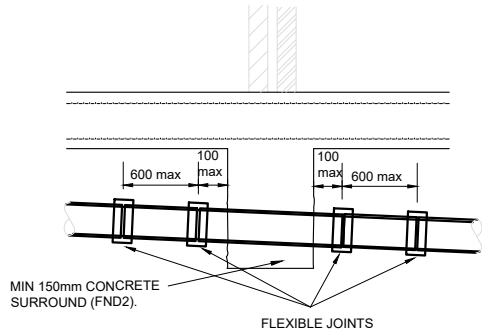


RODDING EYE



SPECIAL PIPE CROSSOVER DETAIL

REQUIRED IF CLEARANCE BETWEEN PIPES CROSSING EACH OTHER IS LESS THAN 300mm



PIPES PASSING THRO' SLAB THICKENINGS

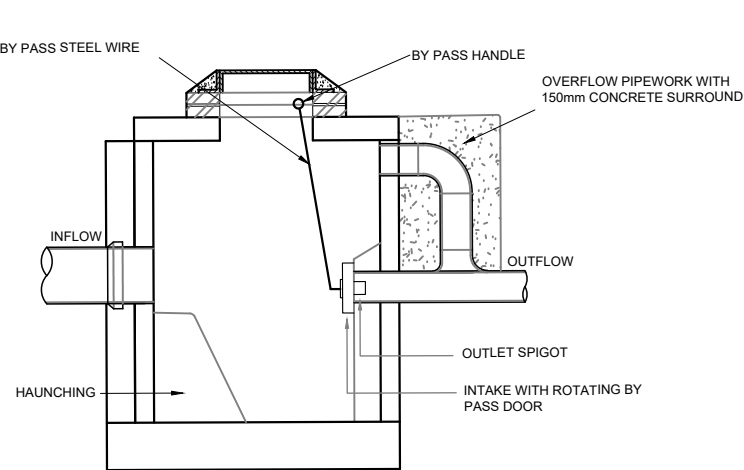
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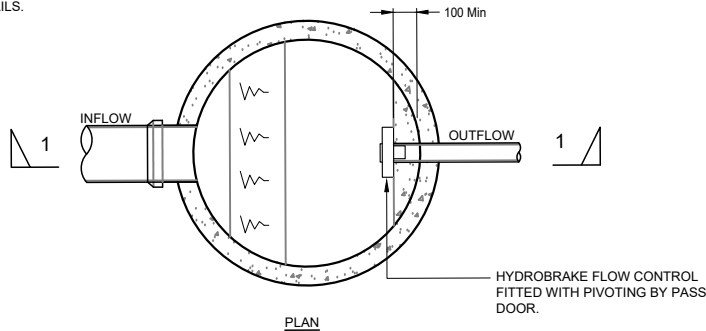
All other design team elements, where indicated, have been imported from the consultant's drawings and reference should be made to the individual consultant's drawings for exact setting out, size and type of component.

C1	CONSTRUCTION ISSUE	AMT	10.05.24	PK
P1	STAGE 4 ISSUE	AMT	08.04.24	PK
Rev	Description	By	Date	Chk'd
Marston & Grundy LLP Consulting Engineers Priory House, Ellesmere Ave Marple, Stockport, Cheshire, SK6 7AN Telephone: 0161 427 7231 Email: mail@marstonandgrundy.com				
Client	MCFC			
Project	MCWFC FACILITY PHASE 1			
Drawing	DRAINAGE DETAILS SHEET 2			
Purpose of Issue	CONSTRUCTION			
Project No.	Scale @ A1	Date	Drawn	Checked
13636	NTS	Apr 24	AMT	PK
Drawing Identifier	project	origin	zone	level
MCW-MaG-ZZ-XX-DR-C-202				
	type	role	number	Revision
				C1

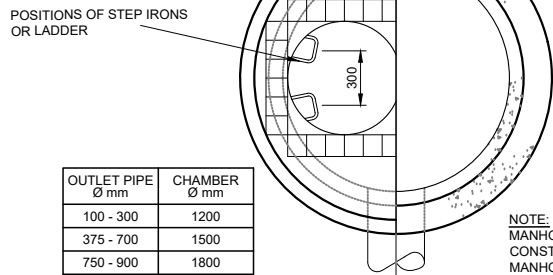
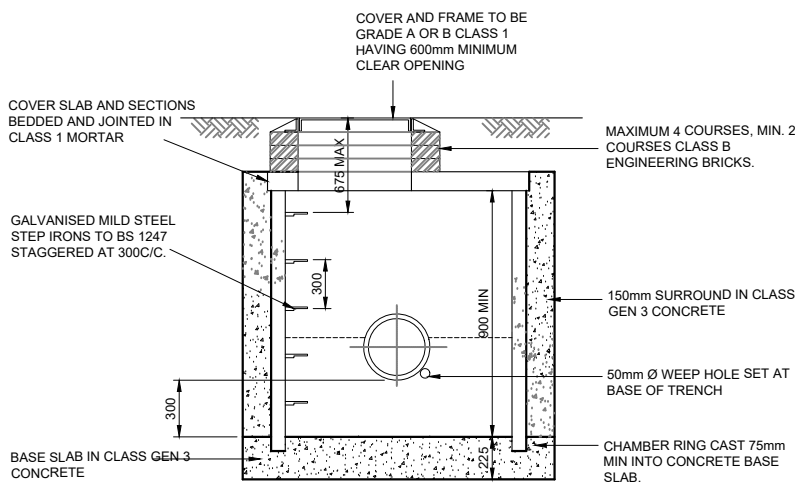


SECTION 1-1

NOTE:
THIS DRAWING IS INDICATIVE ONLY.
SEE MANUFACTURERS DRAWINGS AND
SPECIFICATION FOR CONSTRUCTION
DETAILS.

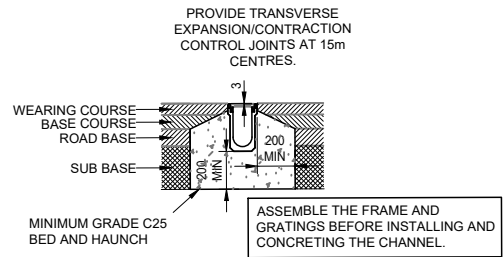


TYPICAL VORTEX CONTROL CHAMBER



(DEPTH TO TOP OF BASE
SLAB 1.2-3.0m)

TYPICAL CATCHPIT CHAMBER



TYPICAL DRAINAGE CHANNEL IN
FLEXIBLE PAVEMENT

NOTES

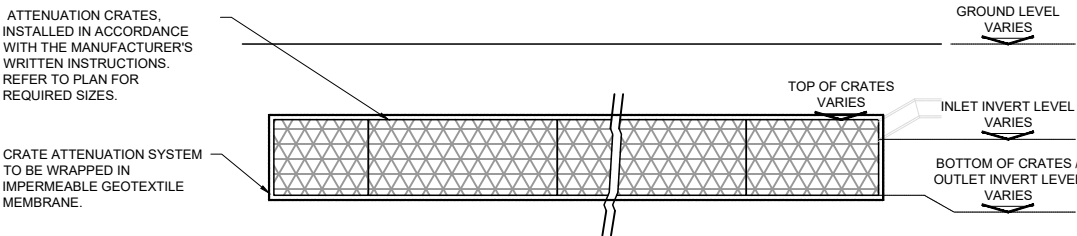
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OPERATION AND MAINTENANCE REQUIREMENTS FOR ATTENUATION STORAGE TANKS

MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY
REGULAR MAINTENANCE	INSPECT AND IDENTIFY ANY AREAS THAT ARE NOT OPERATING CORRECTLY. IF REQUIRED, TAKE REMEDIAL ACTION.	MONTHLY FOR 3 MONTHS, THEN ANNUALLY
	REMOVE DEBRIS FROM THE CATCHMENT SURFACE (WHERE IT MAY CAUSE RISKS TO PERFORMANCE.)	MONTHLY
	FOR SYSTEMS WHERE RAINFALL INFILTRATES INTO THE TANK FROM ABOVE, CHECK SURFACE OF FILTER FOR BLOCKAGE BY SEDIMENT, ALGAE OR OTHER MATTER. REMOVE AND REPLACE SURFACE INFILTRATION MEDIUM AS NECESSARY.	ANNUALLY
	REMOVE SEDIMENT FROM PRE-TREATMENT STRUCTURES AND/ OR INTERNAL FOREBAYS.	ANNUALLY OR AS REQUIRED
REMEDIAL ACTIONS	REPAIR/REHABILITATE INLETS, OUTLET, OVERFLOWS AND VENTS.	AS REQUIRED
MONITORING	INSPECT/CHECK ALL INLETS, OUTLETS, VENTS AND OVERFLOWS TO ENSURE THAT THEY ARE IN GOOD CONDITION AND OPERATING AS DESIGNED.	ANNUALLY
	SURVEY INSIDE OF TANK FOR SEDIMENT BUILD-UP AND REMOVE IF NECESSARY.	EVERY 5 YEARS OR AS REQUIRED



TYPICAL ATTENUATION DETAIL

C1	CONSTRUCTION ISSUE	AMT	10.05.24	PK
P1	STAGE 4 ISSUE	AMT	08.04.24	PK
Rev	Description	By	Date	Chk'd
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Client MCFC				
Project MCWFC FACILITY PHASE 1				
Drawing DRAINAGE DETAILS SHEET 3				
Purpose of Issue CONSTRUCTION				
Project No. 13636	Scale @ A1 NTS	Date Apr 24	Drawn AMT	Checked PK
Drawing Identifier project origin zone level type role number	Revision MCW-MaG-ZZ-XX-DR-C-203 C1			

DRAINAGE NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS, SPECIFICATIONS AND DOCUMENTATION.
2. THE POSITION, SIZE AND LEVELS OF ALL DRAINS ARE TO BE CONFIRMED ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS AND ANY DISCREPANCIES REPORTED IMMEDIATELY TO THE ENGINEER.
3. DO NOT SCALE FROM THIS DRAWING, WORK TO DIMENSIONS OR CO-ORDINATES PROVIDED. ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE NOTED.
4. THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT AND DIVERSION WORKS AS NECESSARY, TO ALL EXISTING SERVICES TO THE SATISFACTION OF THE PUBLIC UTILITIES.
5. THE CONTRACTOR SHALL ALLOW FOR DEALING WITH SURFACE WATER RUN-OFF INTO EXCAVATIONS AND FROM GROUNDWATER BY MEANS OF SUMPS, PUMPING AND DE-WATERING AS APPROPRIATE, IN ORDER TO KEEP THE EXCAVATION AS REASONABLY DRY AS POSSIBLE DURING THE CONSTRUCTION OF THE WORKS.
6. ALL PRIVATE DRAINAGE WITHIN THE SITE IS TO COMPLY WITH THE REQUIREMENTS OF THE RELEVANT BRITISH/EUROPEAN STANDARD AND THE BUILDING REGULATIONS PART H.
7. CONCRETE PROTECTION TO PIPEWORK IS TO BE PROVIDED AS FOLLOWS:

a) ALL PIPEWORK WITHIN PEDESTRIAN/SOFT AREAS WITH LESS THAN 600mmCOVER.

b) ALL PIPEWORK SUBJECT TO VEHICULAR OVERRUN WITH LESS THAN 1.2m COVER.
8. ALL PIPEWORK WITHIN MANHOLES ARE TO BE LAID SOFFIT TO SOFFIT (U.N.O). ALL CHAMBER INVERT LEVELS ARE FOR THE OUTGOING PIPE LEVELS. BACKDROP PIPEWORK SHALL BE CONNECTED AT SOFFIT TO SOFFIT WITH THE RODDING ACCESS LEVEL SPECIFIED.
9. ANY GRADIENTS OF DRAINS INDICATED ARE INDICATIVE ONLY AND THE CONTRACTOR SHALL INSTALL THE DRAINS TO THE SPECIFIED LEVELS SHOWN FOR EACH MANHOLE (U.N.O). CATCHPIT INVERT LEVELS ARE FOR THE OUTGOING PIPE WITH THE SUMP LEVEL SPECIFIED SEPARATELY.
10. CO-ORDINATE SETTING OUT INFORMATION FOR MANHOLES IS TO THE INTERSECTION THE DRAINS AND NOT THE CENTRE OF THE MANHOLE.
11. COVER LEVELS OF THE MANHOLES ARE PROVISIONAL AND SUBJECT TO ADJUSTMENT ON SITE TO SUIT THE FINISHED GROUND LEVELS. ALL EXTERNAL WORKS CONSTRUCTION AREAS TO BE AS LOCATED BY THE ARCHITECT.
12. MANHOLE COVERS AND FRAMES ARE TO BE IN ACCORDANCE WITH THE RELEVANT BRITISH/EUROPEAN STANDARD AND THE FOLLOWING:

a) VEHICULAR AREAS: CLASS E600 & D400, DOUBLE TRIANGULAR, 150mm DEEP DUCTILE IRON COVER AND FRAME WITH THREE POINT COVER SEATING, BADGED FW OR SW FOR FOUL OR SURFACE WATER DRAINAGE.

b) PEDESTRIAN AREAS: CLASS B125/C250, 100mm DEEP, BADGED FW OR SW FOR FOUL OR SURFACE WATER DRAINAGE.
13. DOUBLE SEAL MANHOLE COVERS AND FRAMES ARE TO BE USED ON INTERNAL FOUL WATER DRAINAGE CHAMBERS. FINISH TO BE CONFIRMED BY THE ARCHITECT.
14. HEAVY DUTY COVER SLABS ARE TO BE USED WITHIN VEHICULAR TRAFFICKED AREAS.
15. GULLY GRATINGS AND STEEL CHANNEL COVERS ARE TO BE IN ACCORDANCE WITH THE RELEVANT BRITISH/EUROPEAN STANDARD AS FOLLOWS:

a) AREAS SUBJECT TO VEHICULAR OVERRUN: CLASS D400 MINIMUM.

b) AREAS NOT SUBJECT TO REGULAR VEHICLE OVERRUN (ADJACENT TO KERBS ETC): CLASS C250.

c) GULLY GRATES ADJACENT TO KERBS SHALL BE HINGED ON THE SIDE OF THE TRAFFIC DIRECTION (LEFT HAND SIDE).
16. POSITIONS AND SIZES OF ABOVE GROUND FOUL AND SURFACE WATER DRAINAGE CONNECTIONS ARE TO BE CONFIRMED PRIOR TO CONSTRUCTION WITH THE ARCHITECT AND M&E ENGINEER.

17. ALL OIL/PETROL SEPARATORS TO HAVE OIL ALARM SYSTEM IN ACCORDANCE WITH CLIENT'S REQUIREMENTS AND VENTS IN ACCORDANCE WITH MANUFACTURER'S DETAILS/RECOMMENDATIONS. SEPARATOR TO HAVE FULL CONCRETE SURROUND TO MANUFACTURER'S RECOMMENDATIONS.
18. DIAMETER OF PCC MANHOLES VARIES WITH PIPE SIZE, AND IS TO BE IN ACCORDANCE WITH THE TABLES SHOWN ON THE ACCOMPANYING MARSTON & GRUNDY STANDARD DETAILS DRAWINGS.
19. DRAINAGE CHANNELS ARE TO BE ACO QMAX IN SERVICE YARDS AND ACO MULTIDRAIN IN CAR PARKS, OR SIMILAR APPROVED. CHANNELS ARE TO BE SIZED BY THE SUPPLIER AND APPROVED BY THE ENGINEER IN WRITING PRIOR TO ORDERING. DRAINAGE CHANNELS TO BE INSTALLED TO MANUFACTURERS' REQUIREMENTS. DESIGN OF CHANNELS SHALL BE BASED ON A 1 IN 30 YEAR STORM RETURN PERIOD, 15 MINUTE DURATION.
20. ALL BRICKWORK IN CONNECTION WITH DRAINAGE IS TO BE SOLID CLASS B ENGINEERING BRICK TO THE RELEVANT BRITISH/EUROPEAN STANDARD.
21. ALL PRECAST CONCRETE PIPES, CHAMBER PRODUCTS AND ROAD GULLIES SHALL BE TO THE RELEVANT BRITISH/EUROPEAN STANDARD AND SHOULD BE KITE-MARKED/CE-MARKED ACCORDINGLY.
22. INSITU CONCRETE GRADES TO BE AS STATED ON THE DRAWINGS. DESIGN CHEMICAL CLASS FOR ALL PRECAST CONCRETE PRODUCTS SHALL BE DC4 UNLESS AGREED OTHERWISE.
23. ALL SEPARATORS SHALL BE IN ACCORDANCE WITH THE ENVIRONMENT AGENCY DOCUMENT PPG3 OR APPROPRIATE.
24. ALL BELOW GROUND PLASTIC/GRP TANKS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. THEY SHALL BE PROVIDED WITH SUFFICIENT CONCRETE SURROUND TO COUNTER FLOATATION AND SHALL HAVE A WALL THICKNESS ADEQUATE TO RESIST THE HIGHEST GROUND WATER LEVEL WHICH COULD BE ENCOUNTERED AT THEIR LOCATION.
25. ALL EXISTING DRAINAGE/STRUCTURES TO BE ABANDONED SHALL BE BROKEN OUT AND REMOVED FROM SITE, THE EXCAVATION SHALL BE BACKFILLED WITH A SUITABLE GRANULAR MATERIAL TO THE REQUIRED LEVEL. ALTERNATIVELY, DEEP DRAINS MAY BE CLEANED AND GROUTED WITH A 1:10 CEMENTITIOUS GROUT, WITH STRUCTURES BROKEN DOWN 1m BELOW FINISHED GROUND LEVEL AND BACKFILLED WITH A SUITABLE GRANULAR MATERIAL.
26. WHERE UTILITY/LAND DRAINAGE TRENCHES ETC CROSS OVER DRAINAGE TRENCHES, THE CONTRACTOR SHALL CONSTRUCT AN IMPERMEABLE BARRIER TO PREVENT GROUNDWATER INFILTRATING INTO THE DRAINAGE TRENCH.
27. UPON COMPLETION OF THE WORKS THE CONTRACTOR SHALL CLEAN ALL DRAINAGE BY JETTING, REMOVING ALL DEBRIS FROM SITE. NO DEBRIS SHALL BE PERMITTED TO ENTER THE EXISTING DRAINAGE SYSTEM.
28. ALL WORKS ARE ASSUMED TO BE WITHIN PUBLIC HIGHWAY OR WITHIN LAND OWNERS LANDS & NO WORKS ARE REQUIRED ON THIRD PARTY LAND OWNERS PROPERTY.
29. ALL RWP, GULLY AND CHANNEL CONNECTIONS SHALL BE 150mm DIA U.N.O. WASTE/SOIL STACK CONNECTIONS SHALL BE 100mm DIA. UNO AND SHALL HAVE INTERNAL ABOVE GROUND RODDING EYES OR LARGE ACCESS FITTINGS IN ACCORDANCE WITH BUILDING REGULATIONS.
30. DESIGN ASSUMES THAT NO WATER AUTHORITY SEWERS OR OTHER DRAINAGE SYSTEMS REQUIRE MODIFICATION, DIVERSION OR ABANDONING.
31. BACKFILL TO ALL DRAINAGE TRENCHES TO BE CLASS 6F1 MATERIAL.
32. ALL WORKS WITHIN THE PUBLIC HIGHWAY TO BE REINSTATED TO HIGHWAY AUTHORITY REQUIREMENTS.
33. NO DEEP ROOTING TREES/VEGETATION SHOULD BE PLANTED WITHIN 5.0m OF ANY DRAINAGE WORKS.
34. ALL WPC'S, SRWP'S AND RWP'S ARE SHOWN INDICATIVELY. LOCATIONS SHALL BE CONFIRMED BY OTHERS.
35. ALL MANHOLES LESS THAN 1.5m DEEP ARE CONSIDERED AS NONE MAN ENTRY AND SHALL BE MAINTAINED FROM GROUND LEVEL.

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P1	STAGE 4 ISSUE	AMT	08.04.24	PK
Rev	Description	By	Date	Chk'd
Marston & Grundy LLP Consulting Engineers Priory House, Ellesmere Ave Marple, Stockport, Cheshire, SK6 7AN Telephone: 0161 427 7231 Email: mail@marstonandgrundy.com				
Client MCFC				
Project MCWFC FACILITY PHASE 1				
Drawing DRAINAGE NOTES				
Purpose of Issue CONSTRUCTION				
Project No. 13636	Scale @ A1 NTS	Date Apr 24	Drawn AMT	Checked PK
Drawing Identifier project	origin	zone	level	type
MCW-MaG-ZZ-XX-DR-C-204	role	number	Revision C1	

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- OWNERSHIP BOUNDARY
- PLANNING BOUNDARY
- EXISTING ROOF IMPERMEABLE AREA
- EXISTING HARD LANDSCAPING POSITIVELY DRAINED
- EXISTING COMBINED PUBLIC SEWER
- EXISTING SW PRIVATE DRAINAGE
- EXISTING FW PRIVATE DRAINAGE
- EXISTING COMBINED PRIVATE DRAINAGE

Marston & Grundy LLP
Consulting Engineers
Priory House, Ellesmere Ave
Marple, Stockport, Cheshire, SK6 7AN
Telephone: 0161 427 7231
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Project	MCWFC FACILITY, ETIHAD CAMPUS
---------	----------------------------------

Drawing

EXISTING
IMPERMEABLE AREAS

Project No.	Scale @ A1	Date	Drawn	Checked
13636	1:500	May '24	AMT	PJK

Drawing Identifier							BS1192 Compliant
project	origin	zone	level	type	role	number	revision
MCW-MaG-ZZ-XX-DR-C-210							C1

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LEGEND

- OWNERSHIP SITE BOUNDARY
- DEVELOPMENT SITE BOUNDARY
- EXISTING ROOF IMPERMEABLE AREA
- PROPOSED ROOF IMPERMEABLE AREA
- PROPOSED HARD LANDSCAPING POSITIVELY DRAINED
- EXISTING COMBINED PUBLIC SEWER
- EXISTING SW PRIVATE DRAINAGE
- EXISTING FW PRIVATE DRAINAGE
- EXISTING COMBINED PRIVATE DRAINAGE
- PROPOSED SW DRAINAGE
- PROPOSED FW DRAINAGE
- PROPOSED COMBINED DRAINAGE

C2	UPDATED TO SUIT LATEST LANDSCAPE PLAN	AMT	29.11.24	PK
C1	CONSTRUCTION ISSUE	AMT	10.05.24	PK
Rev	Description	By	Date	CHK'd

Marston & Grundy LLP
Consulting Engineers
Priory House, Ellesmere Ave
Marple, Stockport, Cheshire, SK6 7AN
Telephone: 0161 427 7231
Email: mail@marstonandgrundy.com

Client
MCFC

Project
MCWFC FACILITY,
ETIHAD CAMPUS

Drawing
PROPOSED
IMPERMEABLE AREAS

Purpose of Issue
CONSTRUCTION

Project No.	Scale @ A1	Date	Drawn	Checked
13636	1:500	May '24	AMT	PJK

Drawing Identifier						BS1192 Compliant	
project	origin	zone	level	type	role	number	revision
MCW-MaG-ZZ-XX-DR-C-211							C2

Technical Specification

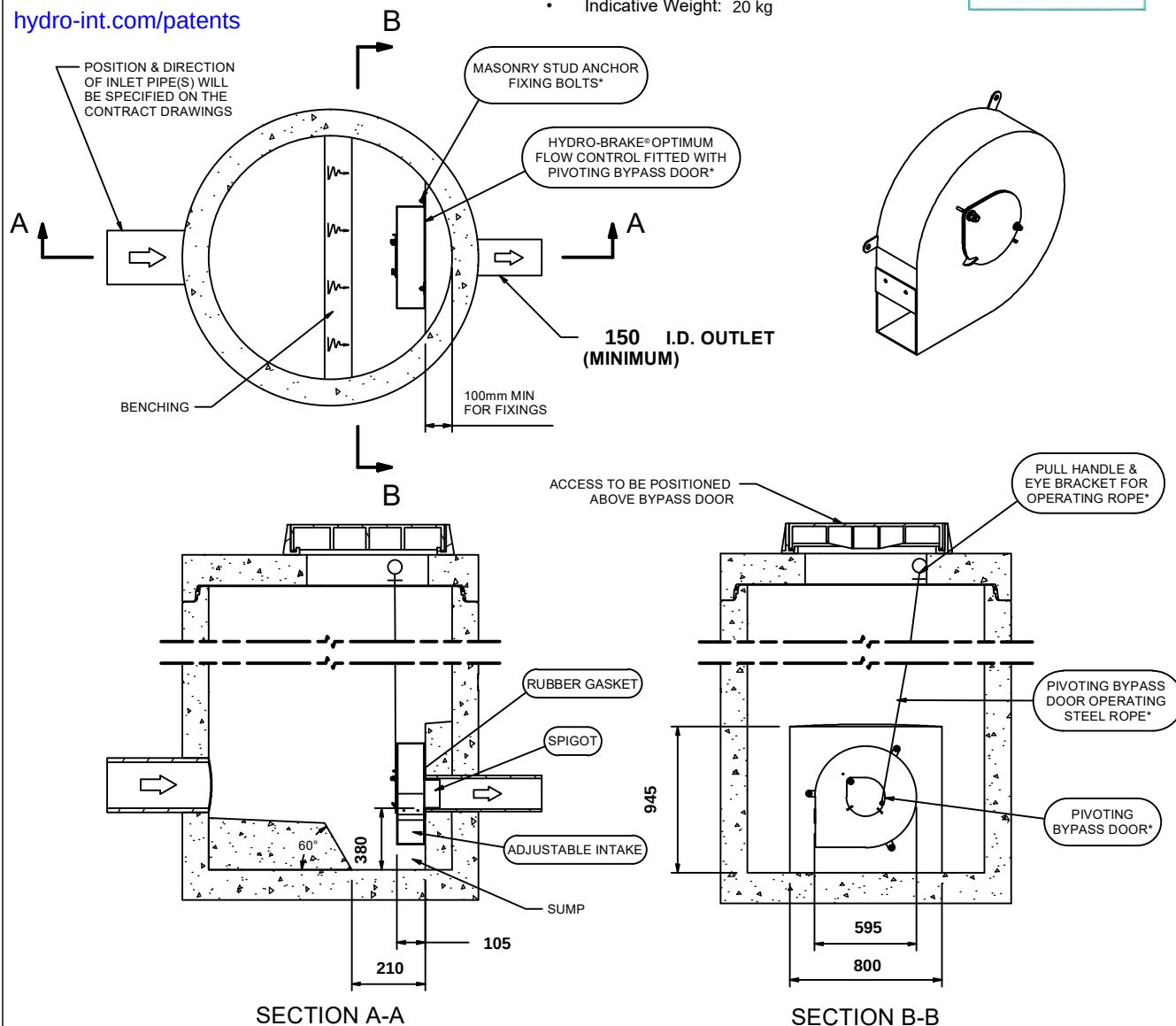
Control Point	Head (m)	Flow (l/s)
Primary Design	1.500	5.000
Flush-Flo™	0.431	4.879
Kick-Flo®	0.878	3.900
Mean Flow		4.321

Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Variable flow rate post installation via adjustable inlet
- Indicative Weight: 20 kg



hydro-int.com/patents



IMPORTANT:

○ LIMIT OF HYDRO INTERNATIONAL SUPPLY

THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS

* WHERE SUPPLIED

HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

**DESIGN
ADVICE**



The head/flow characteristics of this SHE-0098-5000-1500-5000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

**Hydro
International**
A CRH COMPANY

DATE 10/05/2024 12:59

SITE Womens Facility

DESIGNER Andy Thomas

REF 13636

SHE-0098-5000-1500-5000

Hydro-Brake® Optimum

Appendix E – Hydraulic Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	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)	4.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
SW01	0.020	4.00	67.000	450	0.950
SW02	0.038	4.00	67.000	450	1.200
SW03	0.014	4.00	66.900	450	1.525
SW04	0.115	4.00	67.000	1200	1.200
SW05	0.028	4.00	67.000	1200	1.475
SW06	0.020	4.00	66.700	1200	1.525
SW07			66.100	1200	1.525
SW08	0.060	4.00	66.200	1200	1.350
TANK			66.200	100	1.725
SW09			66.600	1500	2.175
CW01			66.600	1200	2.325
EX MH			66.570	1200	2.506

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	SW01	SW02	15.000	0.600	66.050	65.800	0.250	60.0	150	4.19	50.0
1.001	SW02	SW03	26.000	0.600	65.800	65.450	0.350	74.3	150	4.56	50.0
1.002	SW03	SW06	14.000	0.600	65.375	65.175	0.200	70.0	225	4.71	50.0
2.000	SW04	SW05	17.000	0.600	65.800	65.525	0.275	61.8	225	4.17	50.0
2.001	SW05	SW06	27.000	0.600	65.525	65.175	0.350	77.1	225	4.47	50.0
1.003	SW06	SW07	25.000	0.600	65.175	64.575	0.600	41.7	225	4.92	50.0
1.004	SW07	TANK	4.000	0.600	64.575	64.475	0.100	40.0	225	4.95	50.0
3.000	SW08	TANK	5.000	0.600	64.850	64.770	0.080	62.5	150	4.07	50.0
1.005	TANK	SW09	3.000	0.600	64.475	64.425	0.050	60.0	225	4.98	50.0
1.006	SW09	CW01	7.000	0.600	64.425	64.275	0.150	46.7	225	5.04	50.0

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	1.301	23.0	2.7	0.800	1.050	0.020	0.0	35	0.877
1.001	1.168	20.6	7.9	1.050	1.300	0.058	0.0	64	1.089
1.002	1.565	62.2	9.8	1.300	1.300	0.072	0.0	60	1.149
2.000	1.666	66.2	15.6	0.975	1.250	0.115	0.0	74	1.370
2.001	1.490	59.2	19.4	1.250	1.300	0.143	0.0	88	1.337
1.003	2.032	80.8	31.8	1.300	1.300	0.235	0.0	98	1.914
1.004	2.074	82.5	31.8	1.300	1.500	0.235	0.0	97	1.946
3.000	1.274	22.5	8.1	1.200	1.280	0.060	0.0	62	1.173
1.005	1.691	67.2	40.0	1.500	1.950	0.295	0.0	125	1.763
1.006	1.919	76.3	40.0	1.950	2.100	0.295	0.0	116	1.940

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	CW01	EX MH	6.319	0.600	64.275	64.064	0.211	30.0	225	5.08	50.0

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	2.397	95.3	40.0	2.100	2.281	0.295	0.0	102	2.294

Pipeline Schedule

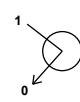
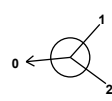
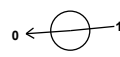
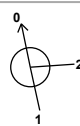
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	15.000	60.0	150	Circular	67.000	66.050	0.800	67.000	65.800	1.050
1.001	26.000	74.3	150	Circular	67.000	65.800	1.050	66.900	65.450	1.300
1.002	14.000	70.0	225	Circular	66.900	65.375	1.300	66.700	65.175	1.300
2.000	17.000	61.8	225	Circular	67.000	65.800	0.975	67.000	65.525	1.250
2.001	27.000	77.1	225	Circular	67.000	65.525	1.250	66.700	65.175	1.300
1.003	25.000	41.7	225	Circular	66.700	65.175	1.300	66.100	64.575	1.300
1.004	4.000	40.0	225	Circular	66.100	64.575	1.300	66.200	64.475	1.500
3.000	5.000	62.5	150	Circular	66.200	64.850	1.200	66.200	64.770	1.280
1.005	3.000	60.0	225	Circular	66.200	64.475	1.500	66.600	64.425	1.950
1.006	7.000	46.7	225	Circular	66.600	64.425	1.950	66.600	64.275	2.100
1.007	6.319	30.0	225	Circular	66.600	64.275	2.100	66.570	64.064	2.281

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	SW01	450	Manhole	Adoptable	SW02	450	Manhole	Adoptable
1.001	SW02	450	Manhole	Adoptable	SW03	450	Manhole	Adoptable
1.002	SW03	450	Manhole	Adoptable	SW06	1200	Manhole	Adoptable
2.000	SW04	1200	Manhole	Adoptable	SW05	1200	Manhole	Adoptable
2.001	SW05	1200	Manhole	Adoptable	SW06	1200	Manhole	Adoptable
1.003	SW06	1200	Manhole	Adoptable	SW07	1200	Manhole	Adoptable
1.004	SW07	1200	Manhole	Adoptable	TANK	100	Manhole	Adoptable
3.000	SW08	1200	Manhole	Adoptable	TANK	100	Manhole	Adoptable
1.005	TANK	100	Manhole	Adoptable	SW09	1500	Manhole	Adoptable
1.006	SW09	1500	Manhole	Adoptable	CW01	1200	Manhole	Adoptable
1.007	CW01	1200	Manhole	Adoptable	EX MH	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
SW01	110.350	71.864	67.000	0.950	450		0	1.000	66.050	150
SW02	105.435	39.608	67.000	1.200	450		1	1.000	65.800	150
							0	1.001	65.800	150
SW03	73.740	37.797	66.900	1.525	450		1	1.001	65.450	150
							0	1.002	65.375	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
SW04	55.782	81.346	67.000	1.200	1200		0	2.000	65.800	225
SW05	70.013	70.385	67.000	1.475	1200		1	2.000	65.525	225
SW06	53.910	52.373	66.700	1.525	1200		1	2.001	65.175	225
							2	1.002	65.175	225
							0	1.003	65.175	225
SW07	15.605	48.644	66.100	1.525	1200		1	1.003	64.575	225
							0	1.004	64.575	225
SW08	9.224	32.290	66.200	1.350	1200		0	3.000	64.850	150
TANK	5.774	47.966	66.200	1.725	100		1	3.000	64.770	150
							2	1.004	64.475	225
							0	1.005	64.475	225
SW09	-0.836	80.000	66.600	2.175	1500		1	1.005	64.425	225
							0	1.006	64.425	225
CW01	-5.582	89.661	66.600	2.325	1200		1	1.006	64.275	225
							0	1.007	64.275	225
EX MH	-6.690	95.882	66.570	2.506	1200		1	1.007	64.064	225

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	0	0

Node SW09 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.006	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0098-5000-1500-5000
Invert Level (m)	64.425	Min Outlet Diameter (m)	0.150
Design Depth (m)	1.500	Min Node Diameter (mm)	1200
Design Flow (l/s)	5.0		

Node TANK Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	64.475
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)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	95.0	0.0	0.800	95.0	0.0	1.200	95.0	0.0	1.201	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	92.521	26.180	30 year 60 minute summer	98.615	26.061
1 year 15 minute winter	64.927	26.180	30 year 60 minute winter	65.517	26.061
1 year 30 minute summer	60.022	16.984	30 year 120 minute summer	59.946	15.842
1 year 30 minute winter	42.121	16.984	30 year 120 minute winter	39.827	15.842
1 year 60 minute summer	40.398	10.676	30 year 180 minute summer	45.598	11.734
1 year 60 minute winter	26.839	10.676	30 year 180 minute winter	29.640	11.734
1 year 120 minute summer	24.980	6.602	30 year 240 minute summer	35.759	9.450
1 year 120 minute winter	16.596	6.602	30 year 240 minute winter	23.758	9.450
1 year 180 minute summer	19.271	4.959	30 year 360 minute summer	26.939	6.932
1 year 180 minute winter	12.527	4.959	30 year 360 minute winter	17.511	6.932
1 year 240 minute summer	15.301	4.043	30 year 480 minute summer	20.981	5.545
1 year 240 minute winter	10.165	4.043	30 year 480 minute winter	13.940	5.545
1 year 360 minute summer	11.775	3.030	30 year 600 minute summer	17.039	4.661
1 year 360 minute winter	7.654	3.030	30 year 600 minute winter	11.642	4.661
1 year 480 minute summer	9.342	2.469	30 year 720 minute summer	15.093	4.045
1 year 480 minute winter	6.207	2.469	30 year 720 minute winter	10.143	4.045
1 year 600 minute summer	7.682	2.101	30 year 960 minute summer	12.278	3.233
1 year 600 minute winter	5.249	2.101	30 year 960 minute winter	8.133	3.233
1 year 720 minute summer	6.859	1.838	30 year 1440 minute summer	8.788	2.355
1 year 720 minute winter	4.609	1.838	30 year 1440 minute winter	5.906	2.355
1 year 960 minute summer	5.653	1.489	100 year +45% CC 15 minute summer	423.061	119.712
1 year 960 minute winter	3.745	1.489	100 year +45% CC 15 minute winter	296.885	119.712
1 year 1440 minute summer	4.127	1.106	100 year +45% CC 30 minute summer	278.374	78.770
1 year 1440 minute winter	2.773	1.106	100 year +45% CC 30 minute winter	195.350	78.770
30 year 15 minute summer	226.195	64.005	100 year +45% CC 60 minute summer	187.417	49.529
30 year 15 minute winter	158.733	64.005	100 year +45% CC 60 minute winter	124.515	49.529
30 year 30 minute summer	147.452	41.724	100 year +45% CC 120 minute summer	114.312	30.209
30 year 30 minute winter	103.475	41.724	100 year +45% CC 120 minute winter	75.946	30.209

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +45% CC 180 minute summer	86.951	22.375	100 year +45% CC 600 minute summer	32.099	8.780
100 year +45% CC 180 minute winter	56.520	22.375	100 year +45% CC 600 minute winter	21.932	8.780
100 year +45% CC 240 minute summer	68.114	18.001	100 year +45% CC 720 minute summer	28.365	7.602
100 year +45% CC 240 minute winter	45.253	18.001	100 year +45% CC 720 minute winter	19.063	7.602
100 year +45% CC 360 minute summer	51.133	13.158	100 year +45% CC 960 minute summer	22.984	6.052
100 year +45% CC 360 minute winter	33.238	13.158	100 year +45% CC 960 minute winter	15.225	6.052
100 year +45% CC 480 minute summer	39.658	10.480	100 year +45% CC 1440 minute summer	16.353	4.383
100 year +45% CC 480 minute winter	26.348	10.480	100 year +45% CC 1440 minute winter	10.990	4.383

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW01	10	66.083	0.033	2.5	0.0194	0.0000	OK
15 minute winter	SW02	10	65.863	0.063	7.3	0.0498	0.0000	OK
15 minute winter	SW03	10	65.433	0.058	9.0	0.0198	0.0000	OK
15 minute winter	SW04	10	65.873	0.073	14.5	0.2219	0.0000	OK
15 minute summer	SW05	10	65.612	0.087	18.0	0.1310	0.0000	OK
15 minute winter	SW06	10	65.270	0.095	29.6	0.1319	0.0000	OK
15 minute summer	SW07	10	64.691	0.116	29.3	0.1307	0.0000	OK
15 minute winter	SW08	10	64.917	0.067	7.6	0.1344	0.0000	OK
60 minute winter	TANK	48	64.648	0.173	20.8	15.6271	0.0000	OK
30 minute winter	SW09	28	64.649	0.224	9.8	0.3961	0.0000	OK
60 minute winter	CW01	46	64.310	0.035	4.5	0.0397	0.0000	OK
60 minute winter	EX MH	47	64.097	0.033	4.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SW01	1.000	SW02	2.5	0.520	0.109	0.0744	
15 minute winter	SW02	1.001	SW03	7.2	1.053	0.351	0.1789	
15 minute winter	SW03	1.002	SW06	9.0	0.764	0.145	0.1670	
15 minute winter	SW04	2.000	SW05	14.5	1.154	0.219	0.2139	
15 minute summer	SW05	2.001	SW06	18.1	1.211	0.305	0.4029	
15 minute winter	SW06	1.003	SW07	29.3	1.633	0.363	0.4493	
15 minute summer	SW07	1.004	TANK	29.3	2.123	0.356	0.0660	
15 minute winter	SW08	3.000	TANK	7.6	1.078	0.338	0.0353	
60 minute winter	TANK	1.005	SW09	11.6	0.538	0.173	0.1088	
30 minute winter	SW09	Hydro-Brake®	CW01	4.6				
60 minute winter	CW01	1.007	EX MH	4.5	1.200	0.048	0.0240	26.2

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW01	10	66.103	0.053	6.2	0.0308	0.0000	OK
15 minute winter	SW02	10	65.913	0.113	17.9	0.0896	0.0000	OK
15 minute winter	SW03	10	65.467	0.092	22.1	0.0315	0.0000	OK
15 minute winter	SW04	10	65.925	0.125	35.4	0.3803	0.0000	OK
15 minute summer	SW05	10	65.677	0.152	44.0	0.2301	0.0000	OK
15 minute winter	SW06	10	65.353	0.178	72.3	0.2480	0.0000	OK
120 minute winter	SW07	106	65.014	0.439	21.7	0.4968	0.0000	SURCHARGED
120 minute winter	SW08	106	65.014	0.164	5.6	0.3313	0.0000	SURCHARGED
120 minute winter	TANK	106	65.014	0.539	26.6	48.6288	0.0000	SURCHARGED
120 minute winter	SW09	106	65.013	0.588	12.0	1.0392	0.0000	SURCHARGED
15 minute winter	CW01	18	64.311	0.036	4.9	0.0412	0.0000	OK
30 minute summer	EX MH	41	64.099	0.035	4.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SW01	1.000	SW02	6.2	0.635	0.270	0.1488	
15 minute winter	SW02	1.001	SW03	17.8	1.283	0.862	0.3601	
15 minute winter	SW03	1.002	SW06	22.0	0.898	0.354	0.3425	
15 minute winter	SW04	2.000	SW05	35.4	1.381	0.534	0.4351	
15 minute summer	SW05	2.001	SW06	44.1	1.417	0.744	0.8406	
15 minute winter	SW06	1.003	SW07	71.7	1.929	0.887	0.9185	
120 minute winter	SW07	1.004	TANK	21.1	1.418	0.256	0.1591	
120 minute winter	SW08	3.000	TANK	5.6	0.999	0.248	0.0880	
120 minute winter	TANK	1.005	SW09	12.0	0.551	0.178	0.1193	
120 minute winter	SW09	Hydro-Brake®	CW01	4.9				
15 minute winter	CW01	1.007	EX MH	4.9	1.223	0.051	0.0253	39.2

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 98.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW01	12	66.858	0.808	11.5	0.4687	0.0000	FLOOD RISK
15 minute winter	SW02	12	66.816	1.016	28.3	0.8044	0.0000	FLOOD RISK
15 minute winter	SW03	12	66.298	0.923	31.2	0.3165	0.0000	SURCHARGED
15 minute winter	SW04	11	66.842	1.042	66.2	3.1769	0.0000	FLOOD RISK
15 minute winter	SW05	12	66.659	1.134	66.6	1.7130	0.0000	SURCHARGED
15 minute winter	SW06	12	66.240	1.065	99.1	1.4841	0.0000	SURCHARGED
180 minute winter	SW07	172	65.936	1.361	30.2	1.5389	0.0000	FLOOD RISK
180 minute winter	SW08	172	65.935	1.085	7.9	2.1925	0.0000	FLOOD RISK
180 minute winter	TANK	172	65.935	1.460	36.6	108.3568	0.0000	FLOOD RISK
180 minute winter	SW09	172	65.934	1.509	10.6	2.6672	0.0000	SURCHARGED
180 minute winter	CW01	172	64.312	0.037	5.0	0.0418	0.0000	OK
180 minute winter	EX MH	172	64.099	0.035	5.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SW01	1.000	SW02	9.4	0.666	0.411	0.2641	
15 minute winter	SW02	1.001	SW03	23.7	1.348	1.150	0.4577	
15 minute winter	SW03	1.002	SW06	28.6	0.912	0.459	0.5568	
15 minute winter	SW04	2.000	SW05	52.8	1.409	0.797	0.6761	
15 minute winter	SW05	2.001	SW06	61.0	1.533	1.029	1.0738	
15 minute winter	SW06	1.003	SW07	96.1	2.416	1.189	0.9943	
180 minute winter	SW07	1.004	TANK	29.4	1.490	0.356	0.1591	
180 minute winter	SW08	3.000	TANK	7.2	1.019	0.319	0.0880	
180 minute winter	TANK	1.005	SW09	10.6	0.532	0.158	0.1193	
180 minute winter	SW09	Hydro-Brake®	CW01	5.0				
180 minute winter	CW01	1.007	EX MH	5.0	1.232	0.053	0.0258	105.5

Appendix F – United Utilities Pre-Development Enquiry Response

Paul Graveney

From: seweradoptions@uuplc.co.uk
Sent: 08 November 2023 13:04
To: Paul Graveney
Subject: RE: PDE CA28, MCWFC, Manchester - 04885350

Good afternoon Paul,

Hope you're well.

United Utilities have no objection to the proposed use of existing connection. Please be advised we would require betterment to be applied to your discharge rates as per your local council which I believe would be 50% in this instance.

Kind Regards



Lewis Barr
Assistant Developer Engineer
Developer Services & Metering
Customer Services
07827286541
unitedutilities.com

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

From: seweradoptions@uuplc.co.uk [seweradoptions@uuplc.co.uk]
Sent: 07/11/2023 16:52
To: paul@marstonandgrundy.com
Subject: RE: PDE CA28, MCWFC, Manchester - 04885350

Good Afternoon,

PRE DEVELOPMENT APPLICATION AT: MCWFC, Manchester – UU Ref 04885350

Please accept this email as receipt of your application received on 07/11/2023 for the above development. This has now been logged on our system and the job reference is 04885350 we would ask that you quote this reference in all future correspondence.

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

Kind regards,



Katie Houghton
Customer Advisor Advanced
Developer Services & Metering
Customer Services

Tel: 0345 072 6067 (option 4)
unitedutilities.com

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

From: Paul Graveney [paul@marstonandgrundy.com]
Sent: 07/11/2023 09:42
To: seweradoptions@uuplc.co.uk
Subject: RE: PDE CA28, MCWFC, Manchester - 04885350

Hi Katie,

So sorry, not sure why the application form was not in the email. See attached.

Paul

From: seweradoptions@uuplc.co.uk <seweradoptions@uuplc.co.uk>
Sent: Tuesday, November 7, 2023 9:33 AM
To: Paul Graveney <paul@marstonandgrundy.com>
Subject: PDE CA28, MCWFC, Manchester - 04885350

Good Morning,

PRE DEVELOPMENT APPLICATION AT MCWFC, Manchester - UU Ref – 04885350

Please accept this email as receipt of your application received on 06/11/2023 for the above development. This has now been logged on our system and the job reference is **04885350**, we would ask that you quote this reference in all future correspondence.

I have reviewed your application (and attachments) and can confirm this is **not** suitable to start technical assessment. The application checklist details the required information for technical assessment; however, for an Engineer to start assessing your application, please provide the following:

1. Application form

In the meantime, if I can be of any further help, please let me know.

Kind regards,



Katie Houghton

Customer Advisor Advanced
Developer Services & Metering
Customer Services

Tel: 0345 072 6067 (option 4)
unitedutilities.com

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

From: Paul Graveney [paul@marstonandgrundy.com]

Sent: 06/11/2023 09:37

To: wastewaterdeveloperservices@uuplc.co.uk

Subject: Pre Development Enquiry - MCWFC Manchester

Good Morning,

Please find attached our pre development enquiry for a new training facility at MCWFC, Manchester.

The proposal is to reuse the existing connection to the combined public sewer.

Regards,

Paul

Paul Graveney

Marston & Grundy LLP Consulting Engineers

Priory House

Ellesmere Avenue

Marple

Stockport

Cheshire

Appendix G – CRT Correspondance

Paul Graveney

From: Gareth Taylor <Gareth.Taylor@canalrivertrust.org.uk>
Sent: 07 November 2023 14:04
To: Paul Graveney
Cc: Paul Kendrick
Subject: RE: MCWFC Facility adjacent the Ashton Canal
Attachments: FW: SWD Explanatory process email

Paul

We do have a process, for which I have attached our SWD Application pack for your information. However, we don't give approval in principle for any SWD proposals to the canal, as we are not a drainage authority and have to assess each individual application on a case by case basis, so we can determine the flood risk and environmental impact. I do know that the Ashton Canal is approaching capacity, so have forwarded your proposal on to our Utility and Hydrology Team to comment.

Additional and something you may wish to consider is that the Trust have a Pre-Planning Service (free of charge) where by you can submit the site proposal and have the Trust consider this before the planning application is submitted to the LHA. If you submit the proposed drainage, you may gain the approval in principle (or not) for the proposed discharge to the canal as part of our internal consultation.

Pre-Planning Service: <https://canalrivertrust.org.uk/specialist-teams/planning-and-design/our-statutory-consultee-role/what-were-interested-in/pre-application-advice>

Hope this helps.
Regards

Gareth Taylor (BSc)

Infrastructure Services, Works Engineer (Northwest)
Northwest Region: Lancaster canal, Leeds to Liverpool canal (Yorkshire Boarder – Greenberfield Locks).
Manchester, Bury & Bolton Canal, Rochdale Canal & Ashton Canal.

canalrivertrust.org.uk

Sign up for the Canal & River Trust e-newsletter canalrivertrust.org.uk/newsletter



Canal & River Trust | NW Waterway | Canal Cottage | Lowerhouse Lane | Rosegrove | Burnley | BB12 6HU | Mob: 07484 913064 |

For further information and a copy of the 3rd Party Code of Practice please follow the link below.

<https://canalrivertrust.org.uk/business-and-trade/undertaking-works-on-our-property-and-our-code-of-practice>

From: Paul Graveney <paul@marstonandgrundy.com>
Sent: Monday, November 6, 2023 1:49 PM
To: Gareth Taylor <Gareth.Taylor@canalrivertrust.org.uk>
Cc: Paul Kendrick <paul.kendrick@marstonandgrundy.com>
Subject: MCWFC Facility adjacent the Ashton Canal

You don't often get email from paul@marstonandgrundy.com. [Learn why this is important](#)

Good Afternoon Gareth,

I am working on a new MCWFC Facility at the MCFC Campus in east Manchester. The proposal is to refurbish the derelict bank and include an extension to it. As shown on the attached location plan, the development is located adjacent the Ashton Canal.

From the drainage investigations carried out to date, we don't believe there are any historic connections to it. All runoff connects to the combined sewer.

In line with the SuDS hierarchy, we need to consider the option of discharging the new surface water runoff at a controlled rate to the Canal.

However, we are also mindful that the CRT may have their own restrictions that need to be applied, especially with it being so close to the Grade 2 listed locks.

With this in mind we should be grateful if you can review and advise your initial thoughts as to the viability (or not) of connecting to the canal with the new surface water runoff and where the preferred location would be.

I look forward to hearing from you.

Regards

Paul

Paul Graveney

Marston & Grundy LLP Consulting Engineers
Priory House
Ellesmere Avenue
Marple
Stockport
Cheshire
SK6 7AN

Tel 07710 758971
Email: paul@marstonandgrundy.com
Web: www.marstonandgrundy.com

Keep in touch

Sign up for the Canal & River Trust e-newsletter <https://canalrivertrust.org.uk/newsletter>

Become a fan on <https://www.facebook.com/canalrivertrust>

Follow us on <https://twitter.com/canalrivertrust> and <https://www.instagram.com/canalrivertrust>

This email and its attachments are intended solely for the use of the intended recipient. If you are not the intended recipient of this email and its attachments, you must take no action based upon them;

Paul Graveney

Paul@marstonandgrundy.com

Your Ref

Our Ref CRTR-PLAN-2023-40329

Thursday 30 November 2023

Dear Mr Graveney,

Proposal: Existing derelict bank being modified internally and extended to form a new Womens Training Facility with external landscaping

Location: Proposed Womens Training Facility Manchester City Football Club Etihad Campus, Ashton New Road, Manchester

Waterway: Ashton Canal

Thank you for your pre-application consultation.

We are the charity who look after and bring to life 2000 miles of canals & rivers. Our waterways contribute to the health and wellbeing of local communities and economies, creating attractive and connected places to live, work, volunteer and spend leisure time. These historic, natural and cultural assets form part of the strategic and local green-blue infrastructure network, linking urban and rural communities as well as habitats. By caring for our waterways and promoting their use we believe we can improve the wellbeing of our nation. The Trust is a statutory consultee in the Development Management process.

The Trust have reviewed the pre-application submission, which mainly relates to query about whether it is possible to create a surface water outfall to the canal from the site, especially given the proximity to a lock. We have the following **general advice**:

The site is next to the towpath side of the Ashton canal. The grade II listed Lock 8 is also sited next to the site. There is a relatively short pound of water here (distance between locks).

In terms of being able to accept surface water from a development site to the canal then this would need to be assessed by the Trust's mandatory surface water process, further details can be found here <https://canalrivertrust.org.uk/business-and-trade/utilities>.

Through the mandatory process we are able to assess whether we can accept surface water from development sites. We are unable to provide an 'in principle' response as to whether this would be acceptable or not outside of this process. You are advised to contact the Canal & River Trust Utilities Team at the utilitiesenquiry@canalrivertrust.org.uk to discuss the acceptability of discharging surface water from the site to the adjacent canal in order to ensure that any necessary consents are obtained. Please be advised that the Trust is not a land drainage authority, and such discharges are not granted as of right- where they are granted, they will usually be subject to completion of a commercial agreement.

We can however advise that due to the number of surface water outfalls in this area and issues of overtopping heading into Manchester, a hydraulic model has been invested in by the Trust, to assess future discharge

Canal & River Trust Planning Team

Canal & River Trust, National Waterways Museum, Ellesmere Port South Pier Road Ellesmere Port Cheshire CH65 4FW
T: 0151 355 5017 E: nationalwaterwaysmuseum@canalrivertrust.org.uk W: canalrivertrust.org.uk

proposals. Any application related to this site will be required to go through a detailed impact assessment and thus will be assessed within this hydraulic model. It is possible that mitigation measure will be required in order to accept this proposal.

In terms of the proximity to the lock we would need to ensure that the outfall here would not have any adverse impact on navigational safety. To meet the principles of the mandatory process then volumes should be at greenfield run off rates and velocity 0.3m/s. The location of any outfall would be assessed as part of the mandatory process.

The outfall would also need to cross the canal towpath to form an outfall to the canal. This would also require separate approval for the outfall / pipe within the towpath as it would cross land registered as Infrastructure Trust Property and would as such require consent from DEFRA. This would form part of the application process. Any works on our land would be required to be carried out in accordance with the Canal & River Trust Third Party Works Code of Practice.

We note that the site is likely to be contaminated, with asbestos having been found present in samples taken. We would want to ensure that no contaminants enter the canal from the site.

The only other plan that has been submitted is a landscape masterplan and this does not provide much detail. We note that a number of trees would be removed, however these appear to be smaller trees and set away from the canal edge.

The above comments are provided based on the details provided and do not prejudice any further comments or concerns that may be raised by the Trust as the scheme progresses.

Please do not hesitate to contact the Utilities team at the Trust, as set out above, if you have any queries.

Yours sincerely,

Tim Bettany-Simmons MRTPI
Area Planner

Tim.Bettany-Simmons@canalrivertrust.org.uk
07342 057926

<https://canalrivertrust.org.uk/specialist-teams/planning-and-design>

Canal & River Trust Planning Team

Canal & River Trust, National Waterways Museum, Ellesmere Port South Pier Road Ellesmere Port Cheshire CH65 4FW
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DETAILED INFORMATION

Water discharge

This section is applicable to canals and navigable rivers where The Trust is riparian owner and those navigations identified in Statutory Instrument No 1195 *'The Inland Waterways of the Trust Board Order 1965'* as amended. The requirements relating to navigation are applicable to other river navigations.

Water Discharge

Introduction

The Trust is not a land drainage authority. Water levels in canals are maintained in dry spells using reservoirs, river abstractions, pumping from ground water sources and re-circulatory pumping at locks ('back pumping'). Water levels are controlled in wet periods using overflow weirs and manually controlled sluices. Without these, the canal would overtop and may breach its banks, causing damage to property and possible loss of life. When the canals were constructed, they were usually a closed system, isolated from the effects of storms. Therefore storm water discharges do not assist in dry periods and can cause severe difficulties in wet conditions. Where a new (or modified) discharge is proposed, it will be reviewed to determine if the benefits to the Trust outweigh the risks of acceptance and approval by Water Management and Environment Teams, the Waterway and the Utilities Team will be required.

The Trust will use its *Mandatory Process on Reviewing & Approving Discharges* when considering proposals. This document will be made available to Promoters on request. The process entails the submission of an Outline and, if necessary, a Detailed Impact Assessment, by the Promoter.

It should not be assumed that an existing discharge can be retained when a site is redeveloped for a new use, if permission is given to retain and re-use an existing discharge a new commercial agreement will normally be required.

Promoters must submit the completed Appendix 4 (Outline Pollution Risk & Hydrological Assessment) to allow the Trust to consider a proposal for a new or modified discharge to its network. To assist the completion of Appendix 4, reference should be made to the Trust's *Surface Water Discharge Guidance – Producing an Outline and Detailed Impact Assessment*. The subsequent sections of this Chapter describe the three main aspects of consideration that The Trust undertakes, namely: flood risk, pollution/water quality risk and navigational impact.

Flood Risk considerations

The only discharge which will normally be considered is uncontaminated surface water in small quantities at suitable locations.

The Trust supports the principles of Sustainable Drainage Systems (SuDS) which should be followed. Guidance is given in the CIRIA publication C523 'Sustainable Urban Drainage Systems – Best Practice Manual' – This refers to the CIRIA Sustainable Urban Drainage Design Manuals C521 for Scotland and C522 for England and Wales. The Flood and Water



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Management Act 2010 introduces changes to the legislation relating to SuDS, and subsequent editions of this document will reflect those changes, once enacted/commenced.

The details of on-site flow attenuation measures (such as SuDS) giving details of design, information about storage or drainage of water in excess of attenuation should be provided as well as any details of maintenance and adoption agreements for SuDS. If the SuDS are not maintained in the long term, then they will fail to provide the design attenuation and The Trust will be exposed to the full un-attenuated additional flood risk. Any SuDS such as underground storage, ponds, soakaways, flow restrictors etc. must have a suitable maintenance regime in place to ensure their effective operation over the life expectancy of the development.

In addition to the above information, the details of the proposed connection with the canal should be provided together with an estimate of the peak velocity of the discharge orthogonal to boat movement.

Discharges are not usually permissible directly above and below locks, adjacent to moving bridges and at mooring sites. Navigational difficulties would ensue as a result of the transverse flows. In order to minimise navigational difficulties associated with transverse flows of water the discharge energy must be minimised in the discharge structure design or by storage. Discharge velocity generally must not exceed 0.3 m/s measured at 90° to the direction of the navigable channel.

Discharges into the Waterway may require consent from the Environment Agency (EA) or the Scottish Environment Protection Agency (SEPA). The Promoter will be responsible for obtaining any necessary consent and providing proof to the Works Engineer that this has been done. It must not be presumed that EA or SEPA consent confers The Trust consent.

New developments must be designed in accordance with "Planning Policy Statement 25 (PPS25)" in England or "Technical Advice Note (TAN) 15" for Wales. These documents set out how flood risk is to be managed during the design and planning process.

If mitigation measures are required, it must be agreed at an early stage whether the new or modified structures are to be procured by The Trust or the Promoter and which party will own and maintain them in the long term. It is usual that the structures are designed and built by the Promoter to an acceptable design and that The Trust assumes long term responsibility for the water control structures only, on its own land, on acceptance of an agreed commuted sum.

Discharges are not usually permissible in short canal pounds between locks. Difficulties could result from the capacity of by-wash weirs, surcharging the pounds and dewatering for the maintenance of locks.

Discharges are not usually permissible directly above and below locks, adjacent to moving bridges and at mooring sites. Navigational difficulties would ensue as a result of the transverse flows. In order to minimise navigational difficulties associated with transverse flows of water the discharge energy must be minimised in the discharge structure design or by storage. The discharge velocity generally must not exceed 0.3 m/s measured at 90° to the direction of the navigable channel.



Pollution/Water Quality considerations

The Trust will not generally accept sewage or trade effluent. Only in exceptional circumstances where there is adequate treatment, evidence of a treatment plant maintenance schedule and adequate dilution will applications be considered.

Discharges into the Waterway may require consent from the Environment Agency or the Scottish Environmental Protection Agency. The Promoter will be responsible for obtaining any necessary permit and providing proof to the Works Engineer that this has been done. It must not be presumed that Environment Agency consent confers Trust consent.

Pollution control measures such as traps, gullies, oil separators, silt traps, swales or detention ponds will be required where appropriate. All pollution control measures should conform to the relevant Environment Agency publications and Pollution Prevention Guidance (PPG) notes. It is unlikely that these will be permitted to be built on land owned by the Trust. Normal practice would be to construct them on the Promoters land with adequate access provided to allow them to be regularly maintained.

The Promoter must supply their long term maintenance plan, with emergency contact numbers for all oil separators, silt traps, swales and other pollution control devices for approval by the Trust. Suitable isolating systems such as valves or stanks must be included at the design stage, in to allow maintenance and provide protection to the receiving waterway from pollution incidents.

Where it is possible to do so at design stage, a representative sample of the proposed discharge water should be taken and analysed for appropriate parameters. The results should be supplied to the Works Engineer for consideration. In some cases an analysed sample of the water in the receiving canal will be required for the purpose of comparison.

During operation, it may be necessary to require that water samples are taken at intervals and analysed. It may be necessary for The Trust or its agents to inspect from time to time the area drained to the Waterway to ensure that the pollution risks remain acceptable. Alternatively, it may be acceptable for the inspection to be carried out by the discharger using a standard self-assessment procedure.

Calculations and plans will be required for the drainage network. The plans should define the pipe runs and illustrate the uses to which the drained areas are to be put and any other factors that may affect the quality of the surface run-off.

Where water is discharged at a higher temperature to that of the normal canal water, consideration will have to be given to the environmental impact. This will involve modelling outputs, with consideration to: the size of the receiving waterway, flow, design of the discharge outlet, and hot water plume dispersal from the outfall. In some cases additional water may have to be passed along the waterway at the Promoters expense to give the required dilution of the discharge. Any additional water required for dilution will be treated as an abstraction, see Section 4.2 below and also included in the discharge quantity for design of mitigation measures.

Navigational Impact considerations

The point of discharge is installed perpendicularly to the canal centre line in both axes. The point of discharge should not protrude past the surface of the canal wall such that it affects the mooring of a craft at the same location.



The pipe diameter for above water surface discharges is limited by the available distance between the normal water level and the underside of the coping stone. Several smaller pipes should be used where feasible.

The point of discharge must be installed such that water cannot flow from the canal or be abstracted using the point of discharge. For gravity discharges a stilling chamber / sand trap / oil interceptor is typically provided on the neighbouring land. For pumped discharges the discharge pipe is typically installed above normal canal water level to avoid siphoning.

At locations where craft will be manoeuvring at low speed the limit to the velocity of discharge will be reduced in proportion to the reduction in craft speed. The discharge velocity generally must not exceed 0.3 m/s measured at 90° to the direction of the navigable channel. The Works Engineer will specify the craft speed. A stilling basin is usually needed to comply with this requirement. In most cases physical or mathematical modelling will be necessary.

Scour protection may be needed.

Discharge structures should be designed to minimise the visual impact on the canal, to allow the quality of the discharge to be monitored and to prevent loss of water from the canal into the drainage system. The structure should be accessible in safety for maintenance and sampling. Where this is not possible, for instance on river navigations, a remote sampling point and a flap valve are needed. Outfall structures should normally be designed for the discharge to take place below the normal water surface, preferably via a stilling chamber arrangement, wherever practicable. Above surface outfalls are only accepted in exceptional circumstances, due to the visual impact and risk of navigational difficulties, although offside outfalls above surface are less likely to cause problems than towpath side.

Fendering and signing of structures may be necessary. In particular pumped discharges will need to be signed to advise waterway users of their intermittent operation.

Discharge structures should be capable of carrying the loads imposed by the use of the towing path maintenance vehicles.

Towpath levels should not be raised to accommodate pipework.

APPENDIX 4: OUTLINE POLLUTION RISK & HYDROLOGICAL ASSESSMENT

The following information is required from the Promoter at an early stage in order to assess the viability or feasibility of the proposal. **Note that this checklist only applies to surface water discharges.** Other types of discharge such as sewage effluent and trade effluent should be treated on a case by case basis, but are not usually accepted.

Scheme Title

Promoter

Pollution hazards

Information on the pollution hazards within the areas to be drained:

Planning use class



Use of area to be drained to canal

Nature and quantities of chemicals, fuel/oil, wastes, liquid food products, and other potentially polluting substances that may be used on area drained

Details of any activities which will occur in the drainage area and which could contaminate surface water.

Whether the site requires or has authorisation from the Environment Agency under section 6 of the Environmental Protection Act 1990 (IPC authorisation), or hazardous substances consent from the local authority under the Planning (Hazardous Substances) Act 1990

Any previous contaminate uses of the site, and if so, any soil contamination found from any site investigations.

If highway drainage is included, average annual traffic density, and whether industrial premises access directly to the road

Management controls

Any documentation relating to the environmental commitment and environmental track record of the Promoter (and of the person ultimately responsible for the drainage if different). It should be relevant both to design and construction and to the use operation and maintenance of the areas drained and of the drainage system with respect to prevention of water pollution, e.g.:

- Company Environmental Policy
- Environmental Management System
- Other relevant procedures or standards
- Where the discharge is an existing one, details of any prosecutions, enforcement notices or cautions from any environmental regulator within the last 5 years relating to the discharge.

Hydrological

The applicant is referred to *Surface Water Discharge Guidance – Producing an Outline and Detailed Impact Assessment*. The aim of this document is to provide an applicant wishing to discharge surface water into the Trust's network with the necessary technical guidance to produce an impact assessment acceptable to the Trust.

The Trust believe that the assessment should reflect the additional risk and a two stage process is adopted of an outline impact assessment (Section 2.1 of the Surface Water Discharge Guidance) followed by a more detailed impact assessment (Section 2.2 of the Surface Water Discharge Guidance), if necessary.

If the applicant can demonstrate, to the Trust's satisfaction, that the peak rate of discharge from the site to the waterway, the 1 in 100 year return period event, after development (including an allowance for climate change (20%) and urban creep (10%)) will be less than (or equal to) the pre-development situation (including an allowance for climate change (20%)) then a statement of this, accompanied by supporting calculations (see Section 2.1), will be regarded as an acceptable Outline Impact assessment.



Canal &
River Trust

From the Outline Impact Assessment the following information should be provided:

Information to be provided Included

Written description of the development site (accompanied by photographs if appropriate) detailing:

Pre-development use and proposed development extent and characteristics of the site.

Existing site drainage arrangements and proposed drainage scheme

Relationship of site to the Trust's waterway

Plan of site showing:

development site catchment area, outline or detailed drainage design and relationship to any part of The Trust's system (e.g. waterway pound(s), river navigation, reservoir, feeder channel etc.) as hard copy or digitally (AutoCAD® DWG, DXF™, and DWF files)

Details of catchment parameters: area, soil, percentage impermeable, percentage permeable etc. used to estimate pre and post development site runoff.

Description of method of runoff estimation employed for pre and post proposed development.

Estimates of pre and post development site runoff (l/s in a 1:100yr event - see Guidance document).

Digital copies of drainage design calculations and, if available drainage model data and result files, for both pre and post proposed development.