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**Engineering Workshop,
Openshaw Campus,
Manchester College**

Drainage Strategy Report

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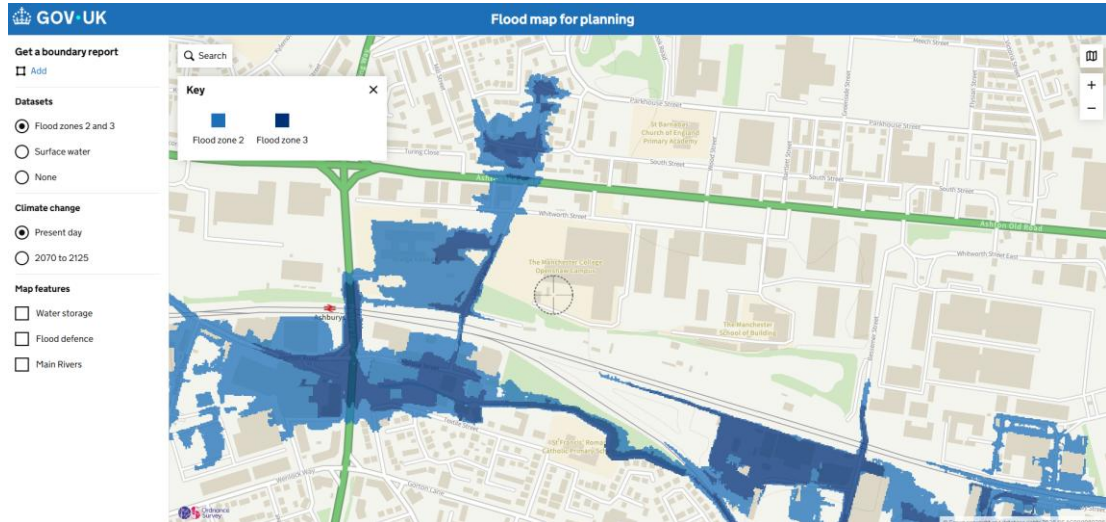
1. Development Details

- 1.1. The development site is the Openshaw campus of the Manchester College, Whitworth Street, Openshaw.
- 1.2. The proposal for the development will see the erection of a new engineering workshop with partial first floor over the area of the part of the existing car park to the rear of the site.
- 1.3. The building is to be a small steel framed structure with a metal clad envelope and composite first floor construction.
- 1.4. Details of the existing site layout can be found in Appendix A at the rear of this report.
- 1.5. Details of the proposed development can be found in Appendix B.

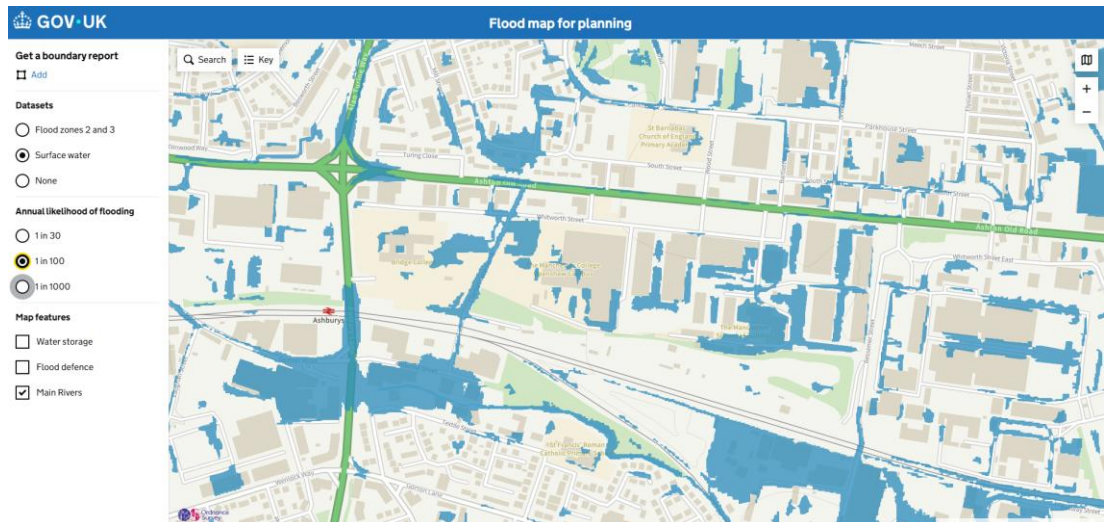


2. Flood Zone Classification

- 2.1. Environment Agency maps have been consulted online and these show the site to be in Flood Zone 1.



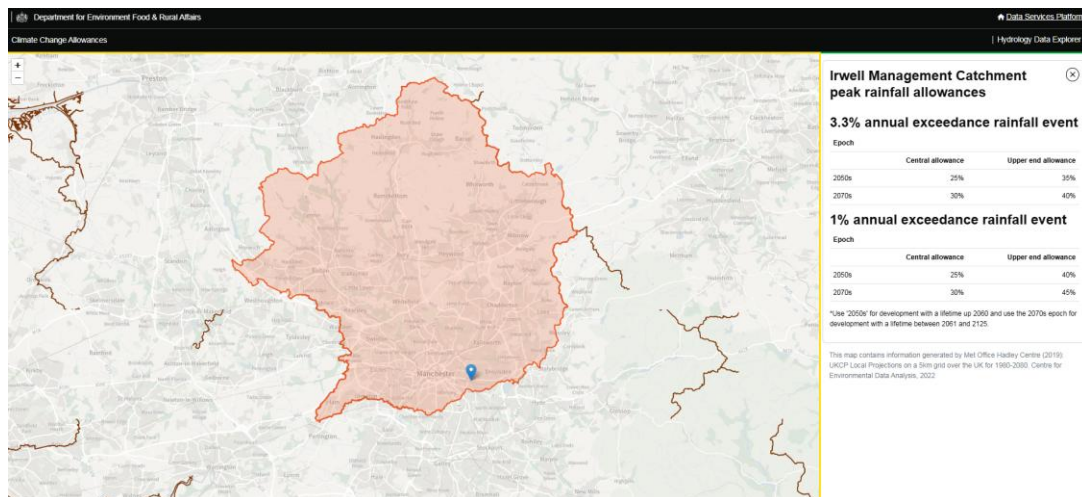
- 2.2. Therefore, the site has a low probability of flooding having a less than 1 in 1000 annual probability of river or sea flooding.
- 2.3. The online mapping also indicates that the site is within an area at very low risk of surface water flooding.





3. Climate Change Allowance

- 3.1. The current guidance indicates that the change in the UK climate could result in significant changes to storm profiles and intensities and therefore an allowance should be made for this within the designs.
- 3.2. The current EA advice can be obtained from the government website. Climate change allowances for peak rainfall intensity are therefore considered on the basis of the river basin catchment area and the design life of the proposed development.
- 3.3. Given the lifetime of the development is expected to be 50 years the peak rainfall intensities can be obtained using the upper end allowances within the EA guidance.
- 3.4. Mapping shows the site to be in the Irwell Management catchment with the information indicated below.



- 3.5. Given the information on the EA website, a climate change allowance of 45% will be taken within the design, representing the upper end allowance for the 1% annual exceedance rainfall event (100YR event). A 35% allowance shall be considered for the 3.3% event (30YR event).
- 3.6. In addition, the requirements of the Building Regulations will be met in that no surface flooding will be accepted for the 1 in 30-year storm event and no surface water shall escape the site boundary for the 100-year event.



4. Existing Drainage Details

4.1. Surface Water Drainage

- 4.1.1. Details of the existing site drainage can be found in Appendix C with a GPR survey and existing drainage drawing presented.
- 4.1.2. Details of drainage survey suggest a separate foul and surface water network serves the site.
- 4.1.3. The existing car park is served by channel drainage which enters the drainage network that was constructed as part of sports hall development carried out in 2019/ 2020.
- 4.1.4. CCTV survey information has shown this discharging to the existing geocellular attenuation tank before existing the site via a flow control.
- 4.1.5. The Hydrobrake flow control limits the discharge from the site to 45.4l/s and is shown to ultimately discharge to the combined sewer that crosses the site.

4.2. Foul Water Drainage

- 4.2.1. The drainage survey work has proven a 150mm foul water drain served the demolished brick workshop building with a separate 100mm foul drain serving the bungalow building.
- 4.2.2. Both pipes combine within manhole F2 before continuing as a 150mm pipe to manhole F4 where the pipe diameter changes to 225mm and would appear to be adopted.
- 4.2.3. Sewer records show this 225mm pipe is a combined sewer passing through the site and entering the wider network within Walney Road.



5. Proposed Drainage Details

5.1. Surface Water Drainage

5.1.1. Under the hierarchical approach from within the National Planning Practice Guidance, discharge of surface water should be considered in the following order:

- i. Infiltration
- ii. Surface water body (river/ watercourse etc)
- iii. surface water sewer or highway drain
- iv. combined sewer

5.1.2. Detailed explanations of the approach have been outlined in the full drainage calculations which have been submitted as part of the planning application with the introduction to those calculations contained within Appendix E at the rear of this report.

5.1.3. An extract of that introduction, outlining the hierarchical approach, is reproduced below:

Information on the existing drainage can be found within Appendix B of these calculations that show the results of a GPR survey together with the drainage designs from Bell Munro Consulting who designed the Sports Hall project in 2020. This clearly demonstrates the SW discharge from the Sports Hall being limited to 45.4l/s by use of a Hydrobrake and discharging to the combined sewer.

Under the hierarchical approach discharge from the new development should be infiltrated to ground. This solution has been considered but soakaway testing proved this solution is not possible due to the contamination issues (hydrocarbons) on the site, the deep made ground and underlying cohesive deposits. Details of the testing has been provided within Appendix C.

The next point of discharge is considered to be the culverted water course which is situated under Clayton Lane South to the west of the development site. This is approximately 125m from the development site but access cannot be gained to it due to the construction of the MUGA sports pitch. Given the network of land drainage constructed under these facilities it is expected that discharge to this location will be prohibitively expensive in proportion to the project.

There are no surface water sewers around the site that could provide an alternative connection point and therefore the proposal is to take the discharge from the building into the Sports Hall drainage.

It is acknowledged that this ultimately discharges to the combined sewer but the use of this solution will see the unrestricted flow removed from the sewer and the discharge controlled by the existing Hydrobrake such that the sewer will not see an increase in discharge rate.

5.1.4. Due to ground contamination and the proximity of the Network Rail land, soakaways are not suitable.

5.1.5. Cost implications and construction practicalities make the discharge to a watercourse prohibitive to the nature of the development.

5.1.6. We are therefore using the existing surface water network on site as the point of discharge using a reduced rate.

5.1.7. Ground investigation extracts, together with the soakaway pit information, can be found within Appendix D.

5.1.8. The full drainage design, including an assessment of the existing site, can be found in document 9529-SWF-XX-XX-TC-C-1001 Drainage Calculations.

5.1.9. Details of the proposed drainage can be found within Appendix F.

5.2. SuDS Measures

5.2.1. There will be a requirement to introduce sustainable urban drainage where appropriate on the scheme as part of the planning requirements.

5.2.2. As discussed in the previous section there is limited space around the building to introduce surface features such as ditches and swales.

5.2.3. Above ground rainwater gardens, such as the SuDSPod (<https://greenblue.com/>) by GreenBlue have been utilised on the site.



- 5.2.4. Permeable paving has been provided to the lower car park area but this needs to be formally drained due to the proximity of the Network Rail asset and no soakaways being allowed within 30m of their site ownership.

5.3. Foul Water Drainage

- 5.3.1. The proposed engineering building is to house a number of toilets, disabled toilet and wash troughs for the students to use during lessons.
- 5.3.2. It is therefore expected that foul water drainage will be able to connect to the existing foul drainage network on the site.
- 5.3.3. Discharge is to be domestic in nature and will not require trade effluent consents.



6. Exceedance

- 6.1. The surface water network is to be designed such that all storm events, up to and including the 100 Yr event, shall be stored below ground within the attenuation system.
- 6.2. Exceedance events will therefore see surface water for greater storms appear on the surface and this must be considered to ensure no increased risk from the development proposals to neighbouring properties.
- 6.3. The southern end of the site is bounded by a brick wall separating the site from Network Rail and will prevent exceedance flows escaping to the south.
- 6.4. Topography indicates that exceedance flows will travel to the west of the site and potentially flood the games pitch.
- 6.5. The western boundary, beyond the sports pitch, is protected by a retaining wall with an upstand kerb of approximately 300mm, preventing exceedance flows escaping the site.
- 6.6. It is therefore expected that exceedance flows will flood the sports pitch.



7. Future Maintenance

7.1. Surface Water

- 7.1.1. The surface water drainage network should be treated like any other gravity-based drainage system.
- 7.1.2. As part of the maintenance, it is recommended that gullies or channel drains are cleared of silt build up on an annual basis to prevent the build-up of silts within the below ground drainage network.
- 7.1.3. As with any drainage system it is recommended that jet clearing of the system is undertaken on a 5 yearly basis. This should check for defects in the pipework and allow for the removal of any debris.

7.2. Foul Water

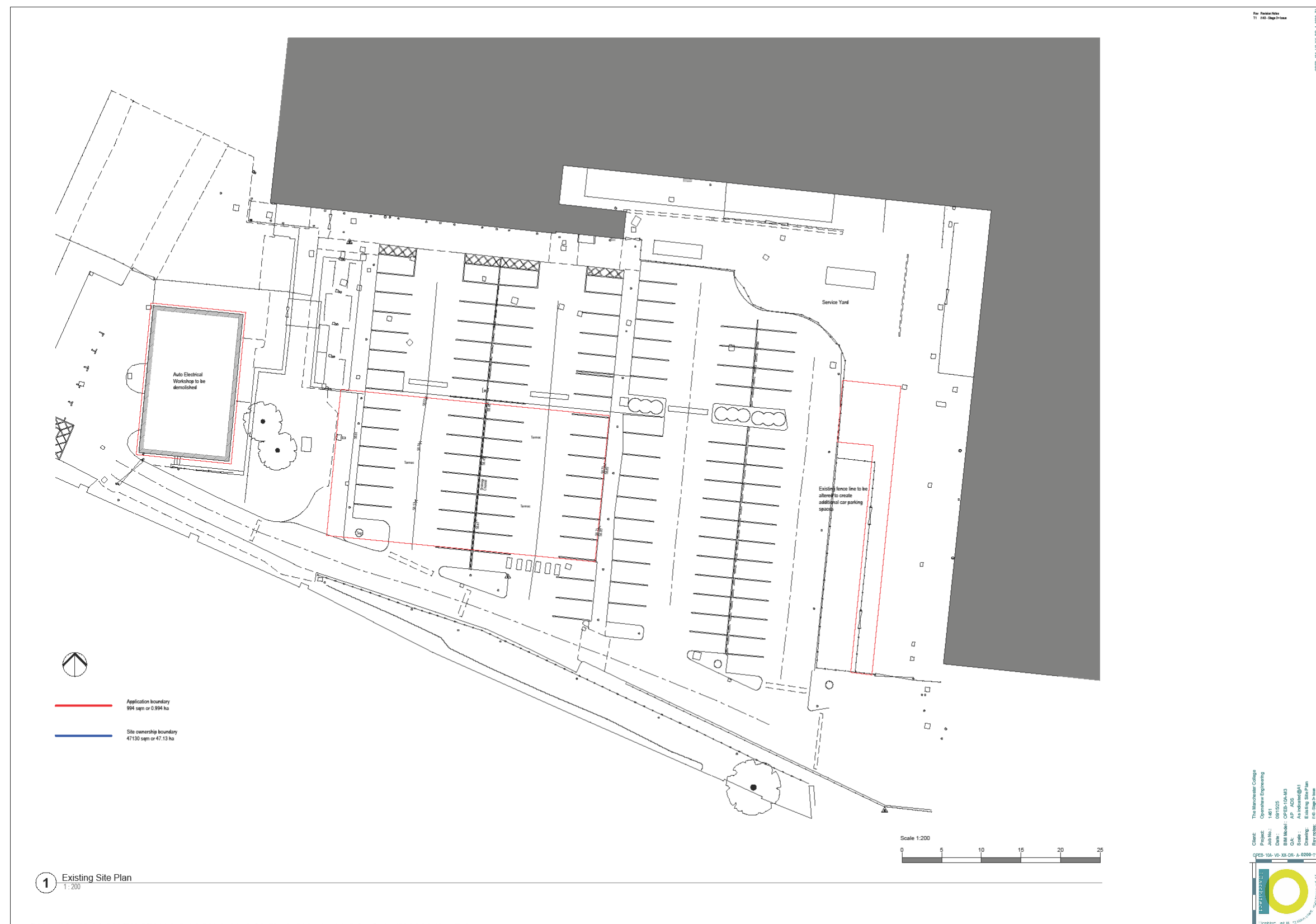
- 7.2.1. The foul water installation is also a gravity-based system and therefore is subject to a similar inspection regime.
- 7.2.2. It is recommended that the system is cleaned on a 5-yearly basis which checks for pipe defects and allows for removal of any blockages.

7.3. Responsible Person

- 7.3.1. At the time of writing this report it is not known who will be responsible for the maintenance of the drainage system although it is likely to be a member of staff of the estates team based on site.

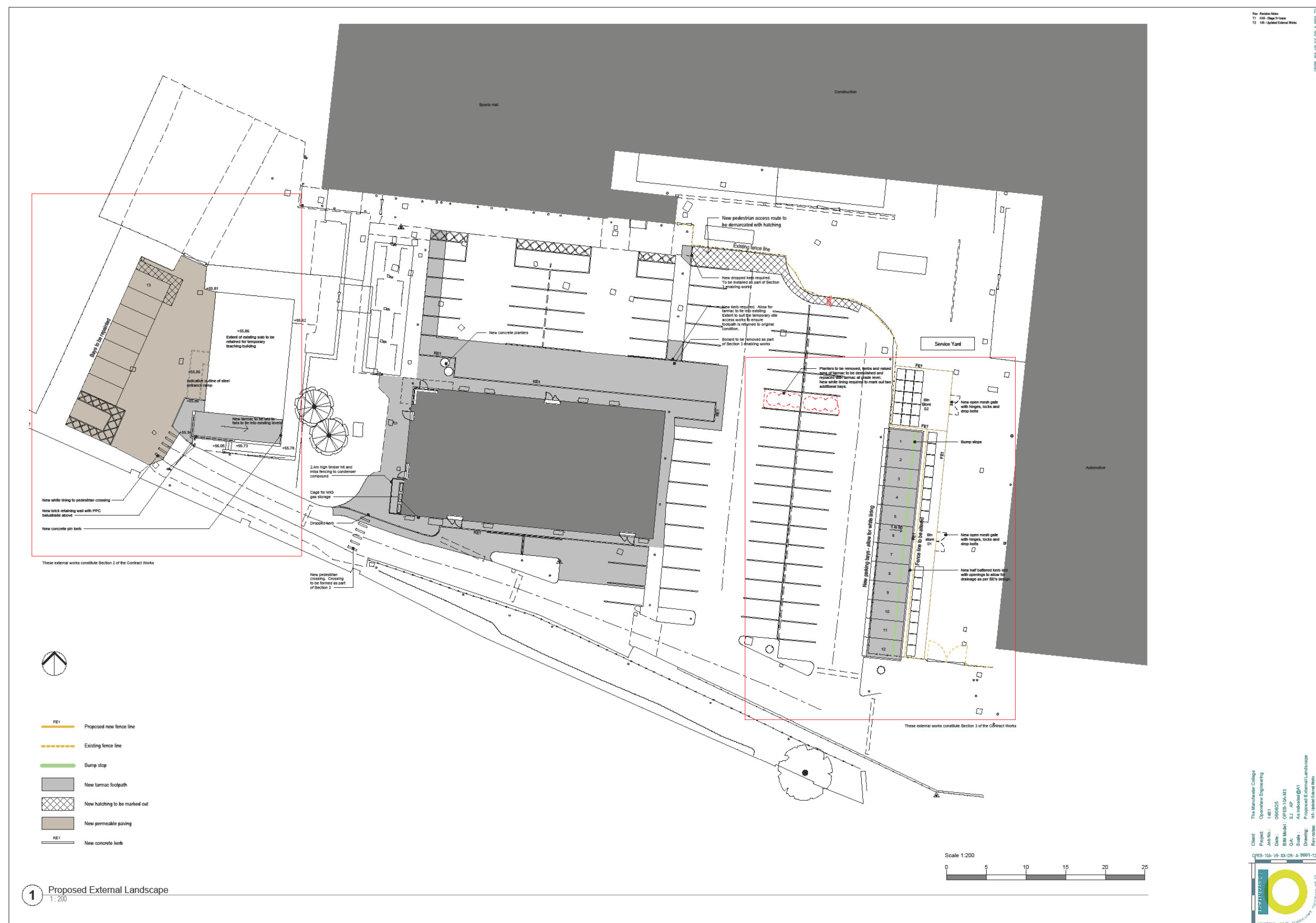


Appendix A Existing Site Plan



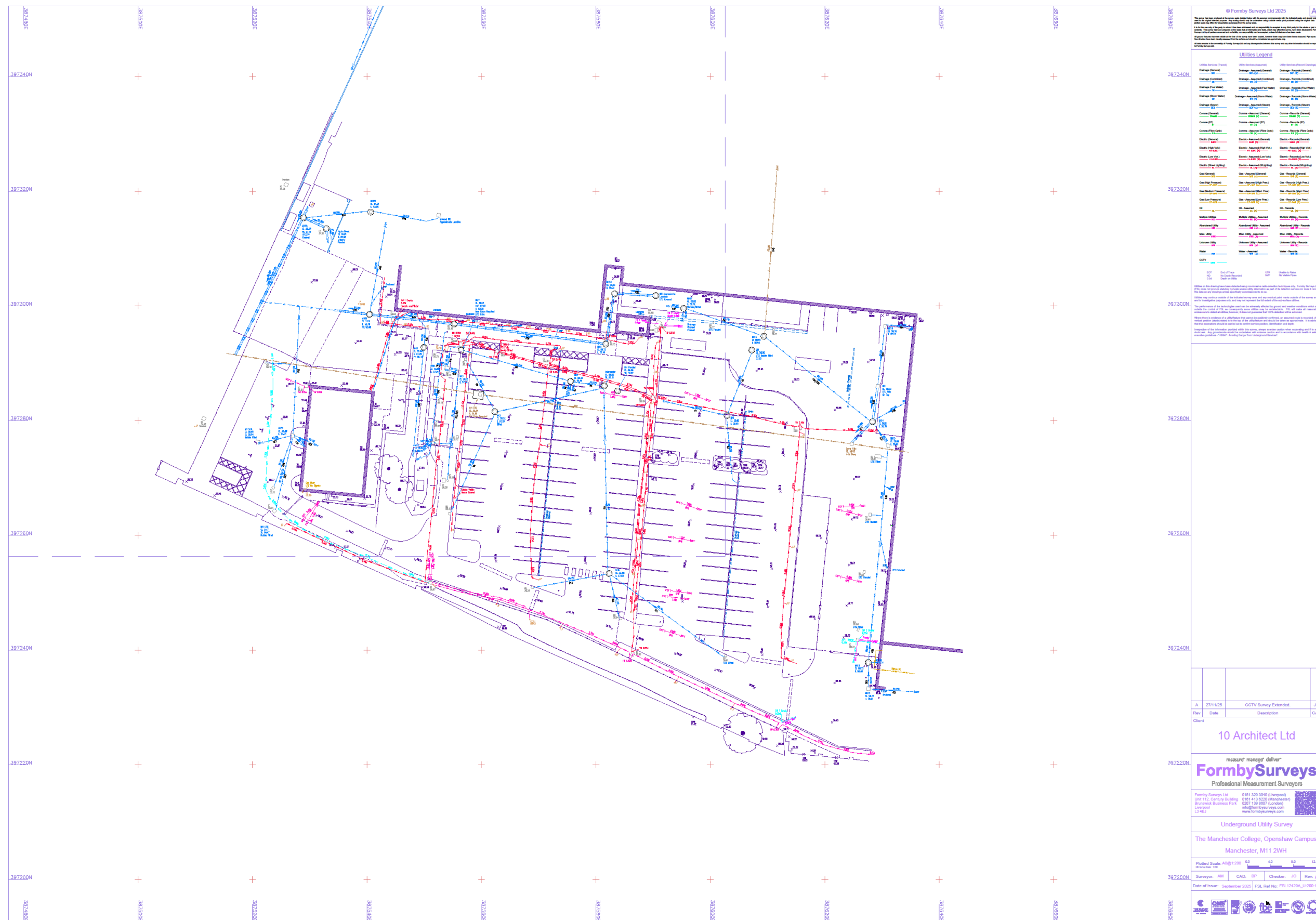


Appendix B Proposed Site Plan





Appendix C Existing Drainage & GPR Survey







Appendix D Ground Investigation Findings



Figure 4: Exploratory Hole Location Plan



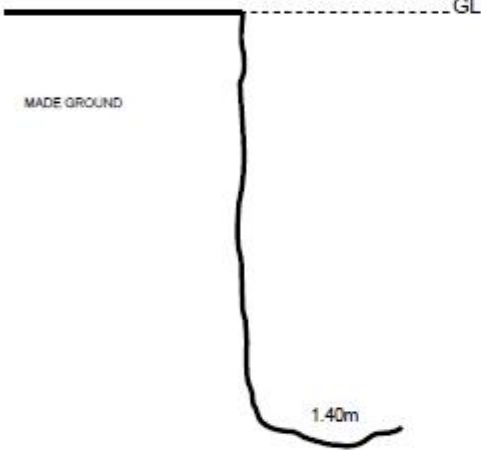
6.5 Soil Infiltration Testing

Two trial pits, TP01 and TP02, were excavated to a depth of 1.40m and 1.00m bgl at the client specified locations.

Due to obstruction and made ground encountered at the location of the trial pits, no infiltration testing was conducted, as made ground is not suitable for infiltration due to potential contamination issues.

Therefore, as made ground was found extensively across the site, the use of soakaways at this site is not considered to be feasible and alternative drainage solutions will be required.



 EARTH ENVIRONMENTAL & GEOTECHNICAL Houldsworth Mill Business & Arts Centre, Houldsworth Street, Stockport, SK5 6DA Tel: 0161 975 6088 Email: info@earthenvironmental.co.uk Web: www.earthenvironmental.co.uk		TRIAL PIT LOG										
Project Name: Openshaw Campus, Manchester College Date: 15/08/2025 Project No.: A7009 Client: SWF Consulting Ltd		Hole Number: TP01 Logged By: C. Low Total Depth: 1.40m Remarks: Trail pit for infiltration testing										
Schematic Profile:  MADE GROUND GL 1.40m NOT TO SCALE		<table border="1"><thead><tr><th>Legend</th><th>Depth (m)</th><th>Description</th></tr></thead><tbody><tr><td></td><td>GL-0.38</td><td>MADE GROUND: Grass over dark brown clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, concrete, brick and mudstone.</td></tr><tr><td></td><td>0.38-1.40</td><td>MADE GROUND: Dark brown clayey sandy fine to coarse GRAVEL of brick, concrete, metal, ash, sandstone and mudstone with low cobble content of brick. Sand is fine to coarse.</td></tr></tbody></table>	Legend	Depth (m)	Description		GL-0.38	MADE GROUND: Grass over dark brown clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, concrete, brick and mudstone.		0.38-1.40	MADE GROUND: Dark brown clayey sandy fine to coarse GRAVEL of brick, concrete, metal, ash, sandstone and mudstone with low cobble content of brick. Sand is fine to coarse.	Trial pit terminated at 1.40m due to concrete obstruction. Trial pit stable. Infiltration test aborted due to deep made ground deposits. Environmental sample taken at 0.2m and 0.9m bgl.
Legend	Depth (m)	Description										
	GL-0.38	MADE GROUND: Grass over dark brown clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, concrete, brick and mudstone.										
	0.38-1.40	MADE GROUND: Dark brown clayey sandy fine to coarse GRAVEL of brick, concrete, metal, ash, sandstone and mudstone with low cobble content of brick. Sand is fine to coarse.										
Pictures:												
												
TP01: Overview of trial Pit		TP01: Internal view of excavation										



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Project Name: Openshaw Campus, Manchester College. Date: 15/08/2025 Project No.: A7009 Client: SWF Consulting Ltd		Hole Number: TP02 Logged By: C. Low Total Depth: 1.00m Remarks: Trail pit for infiltration testing										
Schematic Profile: NOT TO SCALE		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Legend</th> <th style="width: 10%;">Depth (m)</th> <th style="width: 75%;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">GL-0.40</td> <td>MADE GROUND: Grass over dark brown clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, concrete, brick and mudstone.</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">0.40-1.00</td> <td>MADE GROUND: Dark brown clayey sandy fine to coarse GRAVEL of brick, concrete, metal, ash, sandstone and mudstone with moderate cobble content of brick. Sand is fine to coarse.</td> </tr> </tbody> </table> Trial pit terminated at 1.00m due to concrete obstruction. Trial pit stable. Infiltration test aborted due to deep made ground deposits. Environmental sample taken at 0.3m bgl.		Legend	Depth (m)	Description		GL-0.40	MADE GROUND: Grass over dark brown clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, concrete, brick and mudstone.		0.40-1.00	MADE GROUND: Dark brown clayey sandy fine to coarse GRAVEL of brick, concrete, metal, ash, sandstone and mudstone with moderate cobble content of brick. Sand is fine to coarse.
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	0.40-1.00	MADE GROUND: Dark brown clayey sandy fine to coarse GRAVEL of brick, concrete, metal, ash, sandstone and mudstone with moderate cobble content of brick. Sand is fine to coarse.										
Pictures:												
TP02: Overview of trial Pit		TP02: Internal view of excavation										



Appendix E Drainage Calculation



Project					
Engineering Workshop, Openshaw Campus, The Manchester College					
Made By	Date	Checked By	Date	Rev	Contract No./Sheet number
PSS	Oct-25				9529 1

1.0 INTRODUCTION

The project is to see the construction of a new engineering building on the existing car park area to the rear of the site with the building footprint measuring approximately 32.0m x 16.5m. The site lies within flood zone 1 and is not susceptible to surface water flooding according to the online mapping.

At present, the car park area is positively drained by a series of channels and gullies which have been proved by survey to discharge to a separator before entering the final manhole on site. From this point the surface water discharges at an un-restricted rate into the 900mm combined sewer that crosses the car park splitting the area in two.

Under the current regime, the discharge to the sewer has been calculated as:

50% AEP	7.8 l/s (15 minute winter storm)
3.33% AEP	17.0 l/s (15 minute winter storm)
1% AEP	21.6 l/s (15 minute winter storm)

based on FEH 2022 data, an area of 32 x 16.5m and a volumetric runoff coefficient (c_v) of 0.84 for the winter storm. Calculations showing this are included within Appendix A.

Information on the existing drainage can be found within Appendix B of these calculations that show the results of a GPR survey together with the drainage designs from Bell Munro Consulting who designed the Sports Hall project in 2020. This clearly demonstrates the SW discharge from the Sports Hall being limited to 45.4l/s by use of a Hydrobrake and discharging to the combined sewer.

Under the hierarchical approach discharge from the new development should be infiltrated to ground. This solution has been considered but soakaway testing proved this solution is not possible due to the contamination issues (hydrocarbons) on the site, the deep made ground and underlying cohesive deposits. Details of the testing has been provided within Appendix C.

The next point of discharge is considered to be the culverted water course which is situated under Clayton Lane South to the west of the development site. This is approximately 125m from the development site but access cannot be gained to it due to the construction of the MUGA sports pitch. Given the network of land drainage constructed under these facilities it is expected that discharge to this location will be prohibitively expensive in proportion to the project.

There are no surface water sewers around the site that could provide an alternative connection point and therefore the proposal is to take the discharge from the building into the Sports Hall drainage.

It is acknowledged that this ultimately discharges to the combined sewer but the use of this solution will see the un-restricted flow removed from the sewer and the discharge controlled by the existing Hydrobrake such that the sewer will not see an increase in discharge rate.

The building is proposed to have above ground rain gardens in the form of SuDsPODS, a pre-fabricated rain garden supplied by GreenBlue Urban. These are designed to manage the discharge from the roof whilst also improving water quality as the rainwater filters through the planting/ bedding material. Details of the product can be found within Appendix C.

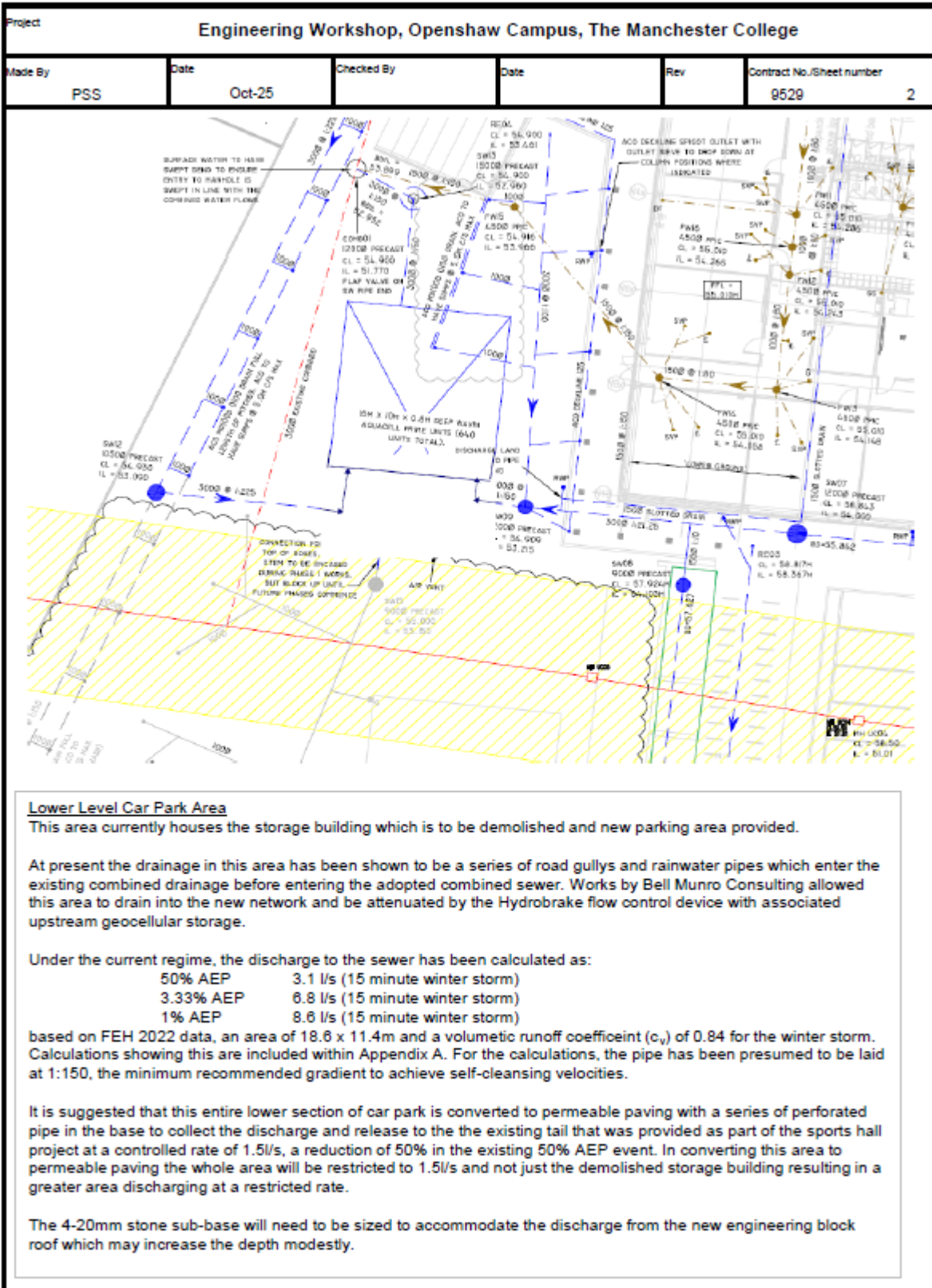
Discharge from the new engineering workshop building is to be taken to the lower level car park which is seeing the demolition of a small portal framed storage building and an increased provision of car parking. Given the demolition works being proposed it is expected that this area of car park can be constructed using permeable macadam to assist with volume control as well as discharge reduction. Again it is expected that this area will connect to the original Sports Hall drainage using the noted connection for the future phase on the Bell Munro drawing.

An extract of the Bell Munro drawing is reproduced overleaf and details the Hydrobrake location, existing geo-cellular attenuation tank and the connections for the side of the MUGA pitch and proposed connection from the lower car park area.

Designs on the proposed drainage have been undertaken with the InfoDrainage design package and the output can be seen within Appendix E of these calculations. Designs have been undertaken with the following allowances for climate change:

3.33% AEP	+40%
1.00% AEP	+45%

in accordance with the Irwell Management Catchment





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As a result of the design of the engineering building and permeable car park the combined sewer will see a controlled rate of discharge of 45.4l/s which is the current rate but also a reduction in flow from the upper level.

Interception Losses
Given the use of above ground rainwater gardens there is an expectation that interception losses will be provided by the soil/ plant use of the surface water run off from the roof of the new building. In addition, there are expected to be losses from the system given the use of an unlined permeable pavement to the lower level car park area.

Whilst infiltration has not been proven to the site it is expected that some losses will occur with the system being provided with a positive connection to the drainage network.

Water Quality
Water quality is to be improved by the use of the filtration benefits from the use of rainwater gardens and the use of the permeable pavement. These systems provide sufficient mitigation when assessed against the low risk land use of the simple index approach.

Exceedance
The southern end of the site is bounded by a brick wall separating the site from Network Rail. Therefore any surface flooding in an exceedance event cannot escape to south. Given the levels on the site, and the significant change in level, the water will pass towards to west where water will potentially flood the games pitch.

The western boundary, beyond the sports pitch is protected by a retaining wall with an upstand kerb of approximately 300mm. This will prevent exceedance flows escaping the site.

The general topographic levels on the site indicate that exceedance flows would be towards the south west and therefore would not be able to leave the site.

Maintenance
The development is proposed to have a traditional gravity system for the building with flows controlled by the rainwater gardens. These gardens will need to be maintained in accordance with the manufacuteres recommendations there are no special planting requirements and therefore the flower beds should be kept in reasonable condition.

The permeable pavement should be swept clean on an annual basis as a minimum but particular attention should be given during the autumn months to reduce leaf litter and reduce risk of pore blockage.

Given the types of SuDs features being used on the project, blockage of the outfall will not be an issue. Therefore only periodic inspection will be required to the orifice plate within the penultimate manhole.



Appendix F Proposed Drainage Layout

