



Benmore Drive, Manchester

TECHNICAL NOTE



31th January 2024

Infiltration Testing Results

AJP Ref: 223-008

PREPARED BY John Marshall



Infiltration Testing Results

Benmore Drive, Manchester

Record of Approval	Originator:	Approved:	Date:
	J. Marshall	J. Smith	31.01.24
Version	Author:	Change Description:	
01	J. Marshall	Initial Issue	31.01.24

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Introduction

This document shall outline the requirements for infiltration testing in accordance with the requirements of BRE 365, for the development at Benmore Drive, Manchester, to determine the capacity of local geology to discharge of Surface water flows to ground, and then provide a summary of the results of testing; alongside the site evidence.

1. General Requirements

To understand the infiltration capacity your chosen location, it is necessary to dig an infiltration testing pit. This pit shall be rectangular in plan, excavated to a depth 1m-1.5m below your soakaway design level and within a likely band of infiltrating strata.

The pit sides shall be vertical, as much as is possible while maintaining the stability of the infiltration pit. This is to ensure a reasonable calculation of the volume of water infiltrating can be utilised. If an infiltration pit cannot be stabilised then an alternative option for testing is to fill any excavated infiltration testing pit with Type 3 MOT stone, with an observation tube for determining water levels. The infiltration pit shall be appropriately cordoned off and appropriate PPE utilised during the testing period.

With the infiltration testing pit is established, it shall be filled to a maximum 300mm below ground level with water to establish its effective depth. The effective depth can be specified by the engineer prior to testing, to suit the site strata. This water level shall be monitored with regular measurements being taken at time intervals to determine the drop in water level from its starting position. The water level must drain down to 25% of its effective depth within 24 hours for a test to be considered successful.

If the first infiltration test is successful, it must be repeated to allow for three complete tests and their recorded water levels. These three tests must be completed within 24 hours and within the same infiltration pit.

On completion of the testing the infiltration pit must be infilled and appropriately compacted to prevent risk to site works and end users.

The records of the water levels must then be provided to the engineer for assessment and to compute the infiltration rate of the strata for the soakaway design.

Key Points;

- ◆ Infiltration testing pit must be in the locale of any proposed soakaway
- ◆ Infiltration testing pit invert level should be set 1m-1.5m below proposed soakaway

- ◆ Infiltration testing pit is to be filled with water three separate times for a complete testing regime.
- ◆ Monitoring of water levels must be recorded in accordance with the requirements as set out in figure 1.1

1.1 Example

Infiltration Testing Log - project Ref:	
Time (mins)	Depth to Water Lvl (m)
0	0.0
0.5	
1	
5	
10	
15	
30	
60	
120	
240	
1440 (max)	25% of effective depth (min finish point)
Pit Dimensions Effective Depth:	X(m) x Y(m) x Z(m)
Date of Testing: Pit Number:	Start time of Testing: End time of Testing:

2. Site Specific Testing Requirements

For the development at Benmore Drive, there has been intrusive investigation to determine the ground conditions and understand the optimal position for any proposed soakaways. Following trial holes dug, it was confirmed that the site strata was a narrow band of made ground underlain by surface clay, with numerous water strikes..

Based on this the infiltration testing pits should be dug to 1.5m depths and utilising pit dimensions of 2.0m x 0.9m x 1.5m, with an effective depth of water of 1m.

Due the proposed drainage system, it is recommended that four number infiltration pits are dug and tested, to the dimensions as mentioned above.

A plan of the these locations can be found in Appendix A.

Key Infiltration Pit criteria:

- ◆ Length 2m x width 0.9m
- ◆ Pit depth 1.5m-2.0m below ground level
- ◆ Effective depth of water 1m-1.5m
- ◆ Number of infiltration testing pits - 4
- ◆ Number of tests per pit - 3

3. On site Investigation

3.1 Location

In accordance with the requires as set out in Section 2 of this report, the testing occurred on site of 4.no testing pits at the dimensions set out above. Due to the constraints of the site, such as existing foliage the trial pits were carried out within the locations as identified in Appendix B.

3.2 Stratum

Having dug the four test pits across a representative proportion of the site area, and in accordance with any possible infiltration strategy, it was determined that all four locations demonstrated that the sub strata for the site is a cohesive clay circa 0.30m -0.50m below ground level, that is overlain by made ground. Photographic evidence of this can be seen in Appendix C.

3.3 Infiltration testing

Having dug the four test pits they were then filled with water on site to achieve a minimum effective depth of 1.0m. They were then monitored over a period of time to determine the fall in the water line to help establish the infiltration capacity of the ground, these results can be seen in Appendix D.

The results for the first test showed little to no movement over the operative period of the day and not to drain down within 24 hours, therefore the 2nd and 3rd test in accordance with BRE 365 were deemed unnecessary.

As none of the testing pits achieved an effective depth equivalent to 25%, the results are not considered suitable for calculation of an infiltration rate.

4. Summary

With the nature of the site sub strata being cohesive clays, numerous encounters with perched water as identified in the Phase II Geotechnical investigation, this site area was not a prime candidate for infiltration based SUDS solutions.

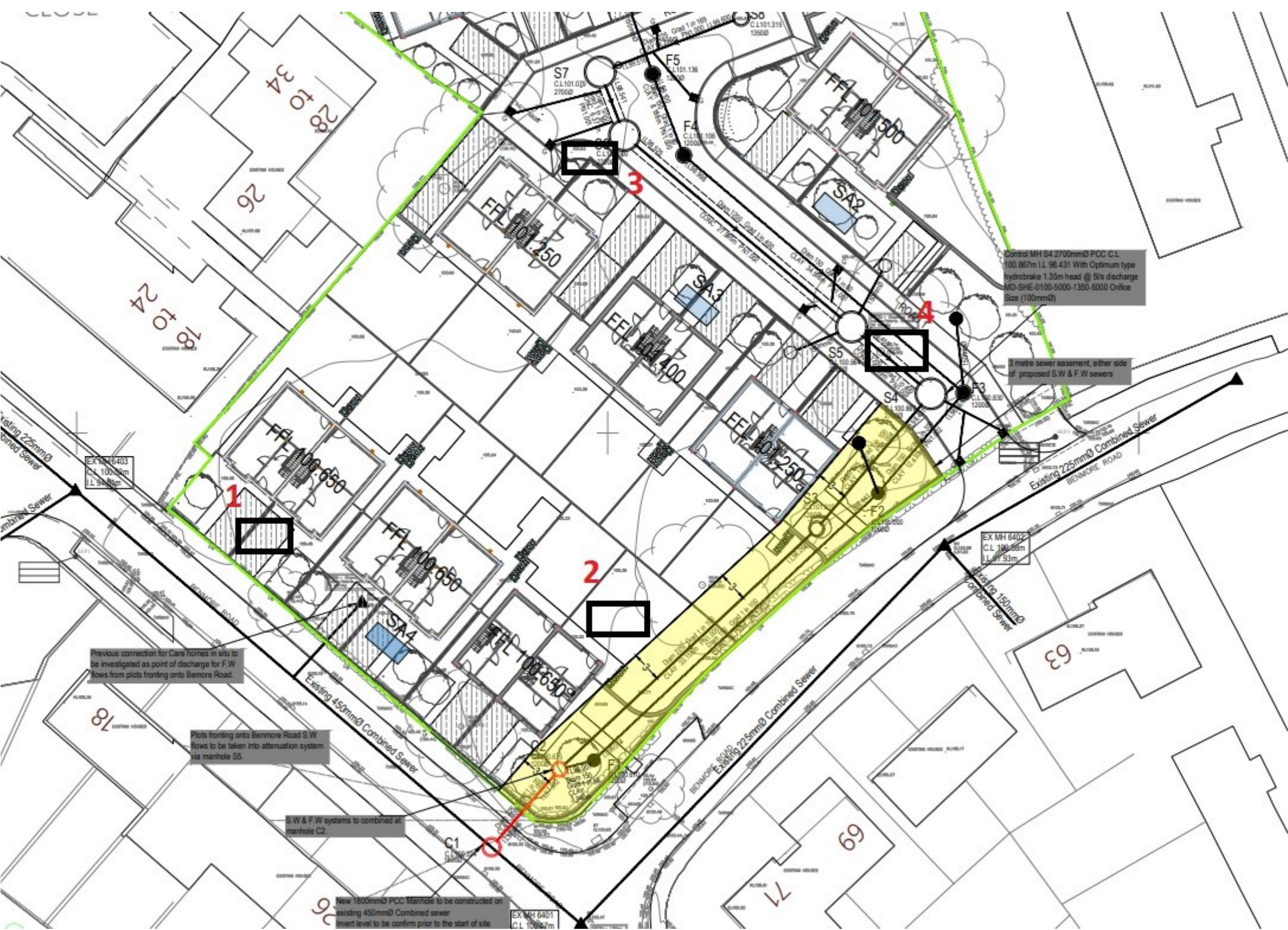
On the basis of the further site testing, which achieved minimal discharge, did not achieve a effective depth of 25%, nor was able to demonstrate three consecutive tests in accordance with the requirements of BRE 365; discharge to ground of surface water flows is not considered viable

Therefore, all drainage systems should have a positive discharge for the captured surface water flows and any SuDS systems utilised can not be based on infiltration.

Appendix A



Appendix B



Appendix C



TRIAL PIT 1 – Initially sand turning to clays at circa 0.5m Below Ground level



TRIAL PIT 2 – Clays at circa 0.30m below ground level.



TRIAL PIT 3- Clays at circa 0.30m below ground level.



TRIAL PIT 4 Clays at circa 0.50m below ground level.

Appendix D

TRIAL PIT 1

Test 1	9.35am	10am	10.20am	10.50am	11.30am	12.30pm	2.000pm
	875mm	840mm	810mm	810mm	810mm	810mm	810mm

Test 2	N/A
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Test 3	N/A
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TRIAL PIT 2

Test 1	10am	10.20am	10.50am	11.20am	12.00pm	12.30pm	1.00pm
	820mm	820mm	730mm	710mm	710mm	710mm	710mm

Test 2	N/A
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Test 3	N/A
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TRIAL PIT 3

Test 1	10.50am	11.10am	11.30am	12.10pm	12.40pm	1.10pm	2.05pm
	750mm	720mm	700mm	700mm	700mm	700mm	700mm

Test 2	N/A
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Test 3	N/A
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TRIAL PIT 4

Test 1	10.30am	10.50am	11.15am	11.45pm	12.15pm	1.00pm	2.10pm
	1050mm	980mm	980mm	980mm	980mm	980mm	980mm

Test 2	N/A
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Test 3	N/A
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