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NEW STREET - LITTLEBOROUGH

TECHNICAL NOTE

NEW STREET, LITTLEBOROUGH – INFILTRATION DRAINAGE FEASIBILITY

Project: New Street, Littleborough – Phase 3

Client: Russell Homes Ltd

E3P Project No.: 15-075

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1. INTRODUCTION

E3P has reviewed whether infiltration drainage represents a feasible means of surface-water disposal for the proposed residential development at New Street, Littleborough.

This assessment is based on the site-specific ground model established by E3P's Phase II Geoenvironmental Site Assessment, dated June 2023, together with the principles set out in the February 2025 Susdrain briefing paper by Wilson and Diaz-Nieto, "Infiltration rates for SuDS: Is it time to ditch BRE 365 tests?".

The purpose of this note is to determine whether further BRE Digest 365 infiltration testing is technically justified. It does not constitute a detailed surface-water drainage design; attenuation volumes, discharge rates and outfall arrangements remain matters for the drainage designer and approving authority.

2. RELEVANT GUIDANCE AND ASSESSMENT APPROACH

Infiltration is an early consideration in the surface-water drainage hierarchy. However, CIRIA C753 requires infiltration design to be founded on an appropriate conceptual ground model and an assessment of the geological, hydrogeological, geotechnical and contamination constraints.

BRE Digest 365 similarly requires consideration of filled ground, variations in soil conditions, preferential seepage routes, groundwater levels and other factors that could affect the long-term performance and stability of an infiltration system.

The Wilson and Diaz-Nieto paper argues that infiltration should be treated as an assessment rather than reduced to a small number of pit tests. It concludes that infiltration testing need not be undertaken merely to demonstrate non-viability where a suitably qualified ground professional can provide a robust, site-specific assessment.





The paper specifically identifies contaminated land and former landfill material as circumstances where introduced water may mobilise residual contamination. It also stresses that water loss into an isolated permeable layer does not demonstrate that the wider ground is suitable for infiltration.

3. NEW STREET GROUND MODEL

The intrusive investigation established a heterogeneous and constrained shallow ground profile:

- Made Ground was recorded in 30 exploratory locations and extended locally to at least 4.70m below ground level. The site includes a recorded former inert landfill and backfilled sand and clay workings.
- The natural drift deposits comprise interbedded clay, sand and gravel, with localised silt, peat and very soft to soft cohesive soils. Bedrock was only encountered at approximately 33.10m to 36.30m below ground level.
- Shallow water strikes and seepages were recorded across the site, locally from only 0.20m to 0.40m below ground level. Subsequent monitoring recorded groundwater from approximately 1.35m below ground level within the shallower installations.
- Granular horizons are discontinuous and commonly bounded by cohesive strata. The Phase II assessment identifies that the cohesive deposits will inhibit vertical migration and encourage lateral groundwater movement.
- Localised peat, soft clay and silt occur particularly around the former and existing pond areas. Excavations within wet granular or soft ground were unstable and were locally affected by running sand.
- Hydrocarbon odours and localised PAH and TPH impacts were recorded within the Made Ground. Heavy metals were also identified in leachate, groundwater and surface-water samples.
- The controlled-waters assessment recognises that rainfall infiltration through the existing uncapped Made Ground has the potential to mobilise contaminants.

4. TECHNICAL APPRAISAL

The presence of isolated sand or gravel horizons does not provide a reliable or sustainable infiltration receptor.

Within layered ground, a trial pit may show short-term water loss into a discrete granular layer while failing to demonstrate the lateral continuity, storage capacity or long-term drainage route of that layer. At New Street, the granular deposits are interbedded with lower-permeability clay and coincide with shallow or perched groundwater.

Water introduced through a soakaway could therefore mound above cohesive horizons and migrate laterally rather than dissipate vertically. This creates several material risks:

- Insufficient unsaturated thickness and reduced storage during wet or seasonally high groundwater conditions;
- Lateral emergence, waterlogging or hydraulic connection to excavations, slopes, services, foundations and neighbouring land;
- Mobilisation of residual contaminants within the Made Ground and former landfill deposits, increasing contaminant mass flux towards shallow groundwater or the River Roch;



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- Softening, erosion or loss of fines within variable Made Ground and granular horizons, with potential adverse effects on ground stability and settlement; and
- Unrepresentative BRE 365 results where a test intersects a localised granular band or is undertaken at a level that does not correspond with the final development levels or proposed infiltration horizon.

These are fundamental constraints on the suitability of infiltration drainage, rather than simply constraints on the numerical infiltration rate.

A positive result at an individual location would not overcome the site-wide groundwater, contamination and stratigraphic constraints and could provide a misleading basis for design. Conversely, undertaking large water-filled trial-pit tests solely to record poor or erratic drainage would introduce excavation, collapse and water-handling hazards without resolving the conceptual limitations.

5. CONCLUSION AND RECOMMENDATION

Infiltration drainage should be discounted as a viable surface-water disposal method for the New Street development. Further BRE 365 testing is not considered necessary or proportionate to establish this conclusion.

This opinion is founded on the site-specific ground model, comprising extensive variable Made Ground and former landfill deposits, interbedded and discontinuous superficial deposits, shallow groundwater and perched seepages, localised soft and organic soils, and the potential for introduced water to mobilise existing contamination.

The conclusion accords with CIRIA C753's requirement for a ground-model-led assessment and with Wilson and Diaz-Nieto (2025), who state that infiltration testing may be omitted where a robust preliminary assessment demonstrates that infiltration is not viable.

The surface-water strategy should therefore be developed using lined or otherwise hydraulically isolated SuDS for storage and treatment, with attenuation and controlled discharge to a suitable sewer or watercourse. The final strategy will be subject to drainage modelling and agreement with the Lead Local Flood Authority and relevant asset owner.

Any basin, swale or permeable pavement proposed for conveyance or attenuation should incorporate an impermeable liner where necessary to prevent infiltration into the underlying Made Ground and drift deposits.

6. REFERENCES

BRE (2016). Soakaway Design. BRE Digest 365.

CIRIA (2015). The SuDS Manual. CIRIA Report C753.

E3P (2023). New Street, Littleborough Phase 3 – Phase II Geoenvironmental Site Assessment, Ref. 15-075-R2-2, June 2023.



Wilson, S. and Diaz-Nieto, J. (2025). Infiltration rates for SuDS: Is it time to ditch BRE 365 tests? Susdrain Briefing, February 2025.

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