Land on the south side of 6 Whitworth Street Openshaw

Manchester M11 2GR

Sustainable drainage proposal

July 2026

By **TL Architects**

Sustainable drainage design proposal for:

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1. Project Description:

The application site lies within Whitworth Street and Clayton lane south.
It covers approx.2000 sqm. Its boundary to the North (Whitworth Street) frontage of the site comprises brick walls (approx. 4 metres high) and 2.4 metres high brick wall to the east Clayton South lane, west and the south are palisade fencing.
The site is presently operated as a self and business storage. It constitutes previously used land (brownfield) and is located within the urban area of Openshaw next to.A635 Ashton old Rd; It is within an area which accommodates a mix of industrial, manufacturing.
The site is not within a conservation area, its development for storage purposes would be in keeping with the character of this primarily employment areas.
The site is located near Manchester Open Shaw College. It is about 2.3 miles to Manchester city centre. The nearest railway station is Ashburys station 5 minutes from the site. The nearest bus station is in Pottery lane/Ashton Road. Access to M60 is approx. 10 mins.
The application seeks consent for continuing to use for self and business storage (total 39 numbers) with a mix of 20 & 40 ft. length on existing area of hard standing.

2. The proposal seeks to manage all surface water runoff via infiltration, discharging to the ground adjacent to the site. This approach aligns with the discharge hierarchy by prioritizing infiltration where feasible.

Site Suitability & Infiltration Strategy

The strategy is underpinned by comprehensive site investigations. Trial pits and infiltration tests (undertaken in accordance with BRE Digest 365) have confirmed the land's suitability for soakaway. Details calculation refer to Appendix 1.Supporting datasheets, including runoff coefficients and verified infiltration rates, are appended to this statement to demonstrate that the ground has adequate capacity to accept the proposed runoff.

Proposed Drainage Design

All surface water runoff will be directed to an underground infiltration system. Given the site's use as a container storage facility, The infiltration rate for the soil type is 'Low' range in accordance with the site investigation and discharge test, therefore, a modular geocellular system is proposed next to the container site, This will enhance the soakaway system, location of the crates see sustainable drainage plan,drawing

no.51. These crates offer a high void ratio (e.g., ~95%) for efficient storage. The system will be wrapped in a permeable geotextile membrane to filter silt and allow water to percolate into the surrounding soil.

Key Design Parameters & Compliance

The design adheres to standard SuDS technical requirements:

· Groundwater Separation: The base of the infiltration feature will be a minimum of 1m above the peak groundwater level to prevent contamination and ensure stability.
· Drawdown Time: The system is designed to achieve a half-drain time of less than 24 hours, ensuring the storage is ready for subsequent storm events.
· Building Setback: The infiltration feature will be located at a safe distance (greater than 5m) from any structures to protect foundation integrity.
· Exceedance Flows: Overland flow routes will be designed to safely convey water during storm events exceeding the system's capacity, preventing flood risk to the site and surrounding properties.

Maintenance & Management

- A maintenance plan will be established to ensure the long-term performance of the drainage system. This will include regular inspections of inlets and outlets for blockages, silt removal, and structural integrity checks.
- · Best Practice: Follow CIRIA's updated guidance (C768F) to avoid common installation pitfalls.
- · Permeable Pavement: Require an annual brushing and vacuuming schedule to prevent clogging.
- · Infiltration Basins/Swales: Mandate litter and debris removal and trimming of vegetation annually, and more frequently as needed.

3. Chosen SuDS Components & Design Details

- Permeable Pavements: Ideal for vehicle access turning and circulation areas, offering combined structural support and infiltration.
- Infiltration Trenches: Perfect for roof runoff or directing overflow from permeable paving when used in a 'treatment train'. They maintain greenfield runoff rates and enhance water quality.
- Grass-Lined Swales: Effective for conveying and treating runoff across the site. They reduce runoff volumes through infiltration and are especially suitable for the perimeters of container storage yards.
- Geocellular Soakaways: A best practice solution for confined areas where high-capacity subsurface storage is needed beneath vehicle circulation or other hardstanding.
- The 'Treatment Train' Approach: It's a requirement of UK planning policy to combine multiple SuDS components. Manage runoff at its source with permeable

paving, then convey any excess via swales to a basin or soakaway for final treatment and attenuation.

4. Site-Specific Considerations

- Water Quality: Identify pollution hazard levels using guidance from CIRIA's The SuDS Manual.
- Container roofs: Low
- Access roads and parking: Low
- Ground Conditions: Site-specific ground investigations (Trial pit and infiltration tests) are essential for confirming the viability of infiltration solutions. If infiltration isn't feasible, a controlled discharge to a sewer or watercourse is required.
- Planning & Regulatory Alignment
- Mandatory Requirement: All new developments must use SuDS for surface water management.
- Design Standards: The updated, freely available CIRIA SuDS Manual (C753) sets the design and assessment benchmark.
- Discharge Hierarchy: Prioritise the following order:
- 1. Infiltration into the ground
- 2. Discharge to a surface water sewer
- 3. Discharge to a combined sewer (last resort)

5. Conclusion

The proposal can achieve a good standard of sustainable drainage, in accordance with the discharge hierarchy and national planning policy.
The strategy is built upon site specific evidence and compliant infiltration tests which confirm that the underlying ground has the capacity to safely accept all surface water runoff. By specifying a modular geocellular system, the design maximizes storage efficiency (approx. 95% void ratio).
Crucially, the proposal meets all key technical standards: a min. 1m ground water separation, a half - drain time of less than 24 hours, and safe building setbacks.
Overland flow routes will manage exceedance events, ensuring no increase in flood risk to the site or surrounding properties.
Furthermore, the inclusion of a clear maintenance plan ensures that the system will remain effective throughout its operational lifespan.
In summary,this application provides a technically sound, maintainable, and fully compliant approach to surface water management. The proposal not only mitigates flood risk but enhances water quality and ground water recharge, fulfilling the core objectives of sustainable drainage. We therefore respectfully request that planning permission be granted on the basis of this SuDS design statement.

Appendix 1.
Soil Infiltration rate and Runoff Coefficient

Based on the trial hole tests and UK best practice (BRE365 & CIRIA C753), and work out the infiltration rate and runoff coefficients.

1. Calculate the Soil Infiltration Rate

Collected from the trial pit on site of the recorded time and water level data, and to calculate the Infiltration Coefficient (q).

1. Soil Infiltration Rate

This is the speed at which water enters the soil, in mm/hr. It's best determined by a field test.

Method: Hand dig trial pit on site. See photos, taken on 28th and 29th July 2026.

Quick Field Estimate: Percolation Test

1. Dig a trial pits 600mm deep x 600mm wide x 1200 mm long, location of the trial pit see site plan.
2. Fill with water and let it saturate overnight.
3. Refill to a marked depth and time how long it takes to drop 1mm.
4. Infiltration rate (mm/hr) = drop in mm / (time in seconds ÷ 3600)

2. Runoff Coefficient (C)

This is the fraction of rainfall that becomes runoff (dimensionless). It depends on surface type and slope.

Formula:
Runoff Coefficient = Rational Method C value

For composite areas, use area-weighted average:
C_weighted = (C1×A1 + C2×A2 + ...) / Total Area

Typical Coefficients by Surface

Urban Areas

· Asphalt/concrete pavement: 0.70–0.95
· Gravel surface: 0.25–0.60
· Lawns, sandy soil (flat): 0.05–0.10
· Lawns, clay soil (steep): 0.25–0.50

Rural/Agricultural

· Pasture, flat: 0.10–0.30
· Cultivated land, moderate slope: 0.20–0.50
· Forest/woodland: 0.05–0.25

Key Factor: Return Period
Higher design storms = higher C values. For a 100-year storm, clay soil lawns can reach C=0.50, while for a 2-year storm it might only be 0.15.

For stormwater design, the runoff coefficient is directly influenced by infiltration:

· High infiltration (sandy soil) → low runoff coefficient
· Low infiltration (clay, saturated, frozen) → high runoff coefficient

In the Rational Method (Q = CiA), for pervious areas, the C value essentially equals 1 - (infiltration rate / rainfall intensity) for that storm, capped by soil storage.

Step 1: Calculate the Drop Per Interval

The readings show water depth (not level from top). Assuming the drop is measured from the water surface:

Time (min)	Start Depth (mm)	End Depth (mm)	Drop (mm)
0	600	– –	
1	600	525	75
1	525	450	75
1	450	375	75
2	375	300	75
4	300	225	75
16	225	150	75
106	150	75	75

The drop is a consistent 75 mm each time, but the time increases as the soil saturates.
Step 2: Percolation Time (Standard Metric)

Metric perc rate = Time (min) / Drop (mm)

Interval	Time (min)	Drop (mm)	Perc Rate (min/mm)
1	1	75	0.013
2	1	75	0.013
3	1	75	0.013
4	2	75	0.027
5	4	75	0.053
6	16	75	0.213
7	106	75	1.413

The standard perc value is usually the slowest stable rate or the average of the last few readings. The final interval gives 1.4 min/mm, which is into slow-draining territory but still technically permeable.

Trial pit with the dimensions 1.2m × 0.6m, we can now calculate the true infiltration rate.
Step 1: Pit Geometry

· Base area: 1.2 × 0.6 = 0.72 m²
· Perimeter: 2 × (1.2 + 0.6) = 3.6 m

For each interval, the wetted sidewall area changes as depth drops. The total infiltration area at each interval's average depth is:
Infiltration Area = Base Area + (Perimeter × Average Water Depth)

Interval	Avg Depth (m)	Side Area (m²)	Total Area (m²)
1	(0.600+0.525)/2 = 0.5625	3.6×0.5625 = 2.025	0.72+2.025 = 2.745
2	0.4875	1.755	2.475
3	0.4125	1.485	2.205
4	0.3375	1.215	1.935
5	0.2625	0.945	1.665
6	0.1875	0.675	1.395
7	0.1125	0.405	1.125

Step 2: Volume Infiltrated Per Interval

Volume = Drop (0.075m) × Base Area (0.72m²) = 0.054 m³ per interval (constant).

Step 3: Calculate Infiltration Rate Per Interval

Infiltration Rate (mm/hr) = (Volume / (Infiltration Area × Time in hours)) × 1000

Interval	Time (hr)	Vol (m³)	Area (m²)	Rate (mm/hr)
1	0.0167	0.054	2.745	1179
2	0.0167	0.054	2.475	1308
3	0.0167	0.054	2.205	1468
4	0.0333	0.054	1.935	838
5	0.0667	0.054	1.665	487
6	0.2667	0.054	1.395	145
7	1.7667	0.054	1.125	27

Step 4: Final Design Infiltration Rate

The rate stabilised at 27 mm/hr in the final interval (the standard approach takes the slowest steady reading).

Result: 27 mm/hr

This Means
Rating Infiltration Rate

- High 200 mm/hr
- Medium 50–200 mm/hr
- Low 15–50 mm/hr
- Unsuitable < 15 mm/hr

The soil is in the "low" range — typical of a clay loam or silty clay. It will infiltrate water, but slowly. This means soakaway sizing will need to be generous, and we'd need to factor in a half-drainage time for storm events.

Runoff Coefficient

For a low-infiltration clay loam, typical runoff coefficients are:

- Flat lawn/pasture: 0.15–0.25
- Sloped lawn: 0.25–0.40
- Bare compacted soil: 0.35–0.55

For a gentle sloping lawn on your low-infiltration soil (27 mm/hr, clay loam/silty clay), the design values:

Runoff Coefficient

0.25 – 0.30

- 2 to 10-year storm: use 0.25
- 100-year storm: use 0.30

This assumes typical grass cover. If the lawn is patchy, compacted, or heavily used, lean towards 0.35.

Final Summary

Parameter Value
Soil Infiltration Rate 27 mm/hr
Runoff Coefficient (C) 0.25 (standard design)

Appendix (2)

Flood Zone mapping

The application site is situated adjacent to the Flood Zone 2 indicating with light blue colour

Appendix (3) Surface water mapping

Your selected location: Brada Catering Fabrication Ltd, 6, Whitworth Street, Openshaw, Manchester, M11 2GR

This information tells you the flood risk of the land around a building, not the building itself.

Flooding is hard to predict and there is always a chance any flood water could be deeper than what we show.

▶ What the flood risk ratings mean

Chance of flooding to 20cm

Present day		2040 – 2060	
60cm (2ft)		**60cm** (2ft)	
30cm (1ft)		**30cm** (1ft)	
20cm (8in)	Very low	**20cm** (8in)	Very low

Appendix 4 Trial pit A photos for soil investigation and tests

1. Trial pit A 0.6mx1.2mx0.6m deep

2. Soil with mix of sandy and clay loam

3.Trial pit A

4. Soil samples

5.Trial pit A with 25% water left

6.Trial pit A test infiltration rate

7. Trial pit A with full water

8. Trial pit A –half water