

Sustainable Drainage System for surface water

Proposed

Replacement building for Gospel Hall

Address

19 Groveland Road,
Reading RG7 1DP

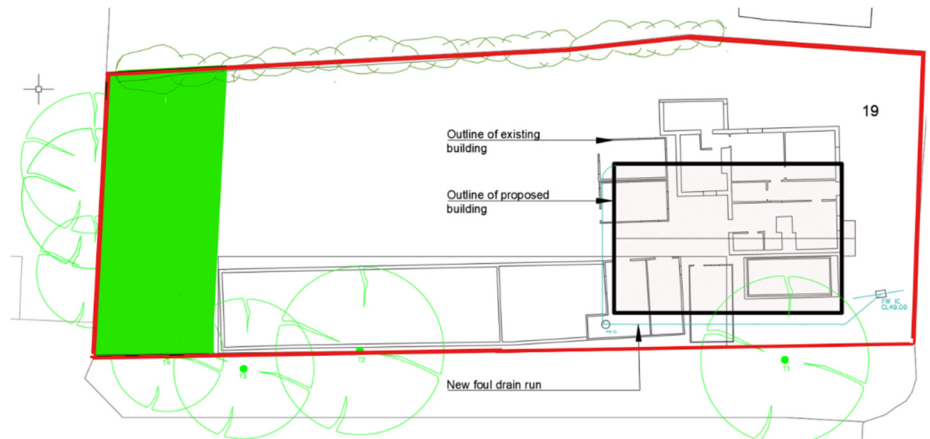
Rev A

Date 17 April 2026

Planning Permission Ref: 250702

Condition 10. Drainage Details

BRE 365: Soakaway Design (2016)
Assessment.



1. Introduction

This project involves the re-construction of a building with access, associated landscaping, parking and all ancillary infrastructure. The existing site is entirely covered with hardstanding – buildings and tarmac. Following development a substantial area of wild grass ecological planting and native hedging to the perimeters will significantly reduce the run-off area which currently discharges into soakaways.

The assessment is to determine whether infiltration drainage is feasible at the proposed development and to size an appropriate soakaway structure to accommodate the runoff.



2. Source Data & Assumptions

2.1 Contributing Impermeable Area

The proposed development generates 830 m² Impermeable Area:

2.2 Design Rainfall Depth

In the absence of FEH storm modelling for preliminary sizing, BRE 365 allows the use of a 50 mm design rainfall depth for feasibility-stage calculations.

2.3 Infiltration Rate

$$K = 5 \times 10^{-6} \text{ m/s}$$

Converted to m/hr: $5 \times 10^{-6} \text{ m/s} \times 3600 = 0.018 \text{ m/hr}$ or **18mm/hr**

This value is used for soakaway design with a depth of 1.0 m effective storage assumed to allow calculation.

2.3 Groundwater level

Minimum 1 m clearance to water table to be established from trial hole.

3. Runoff Volume Calculation

BRE 365 requires the soakaway to temporarily store the design rainfall volume:

$$V_{\text{runoff}} = A \times R \quad V_{\text{runoff}} = 830 \times 0.05 = 41.5 \text{ m}^3$$

4. 24-Hour Drain-Down Check

BRE 365 requires the soakaway to empty to at least 50% of storage volume within 24 hours.

$$\text{Infiltration: } 0.018 \times 24 = 0.432 \text{ m}^3$$

Each square metre of soakaway base infiltrates 0.432 m^3 in 24 hours.

To empty $41.5 \times 50\% = 20.75 \text{ m}^3$ within 24 hours:

$$\text{Required soakaway footprint area } B = 20.75 / 0.432 = \mathbf{48 \text{ m}^2}$$

5. Recommended Soakaway Dimensions

Using modular soakaway crates (typical 95% void ratio):

$$V_{\text{gross}} = 41.5 / 0.95 = \mathbf{43.7 \text{ m}^3 \text{ volume required}}$$

$$\text{Depth required} = 43.7 \div 48 = 0.91 \text{ m min}$$

Net storage using 1.2m deep hollow crate construction $3\text{m} \times 16 \approx 43.2 \text{ m}^3$ (using 95% voids)

Exceeds required storage requirement (41.5 m^3)

6. Conclusion

Based on a preliminary infiltration rate of $5 \times 10^{-6} \text{ m/s}$, the site is suitable for infiltration drainage. A soakaway designed in accordance with BRE Digest 365 can successfully manage runoff from 830 m^2 of impermeable surface area