



Ditch Assessment Issue 1

16 February 2026

Land at Grid Reference 535270138258,
Hophurst Lane, Crawley Down.

1.0 Introduction

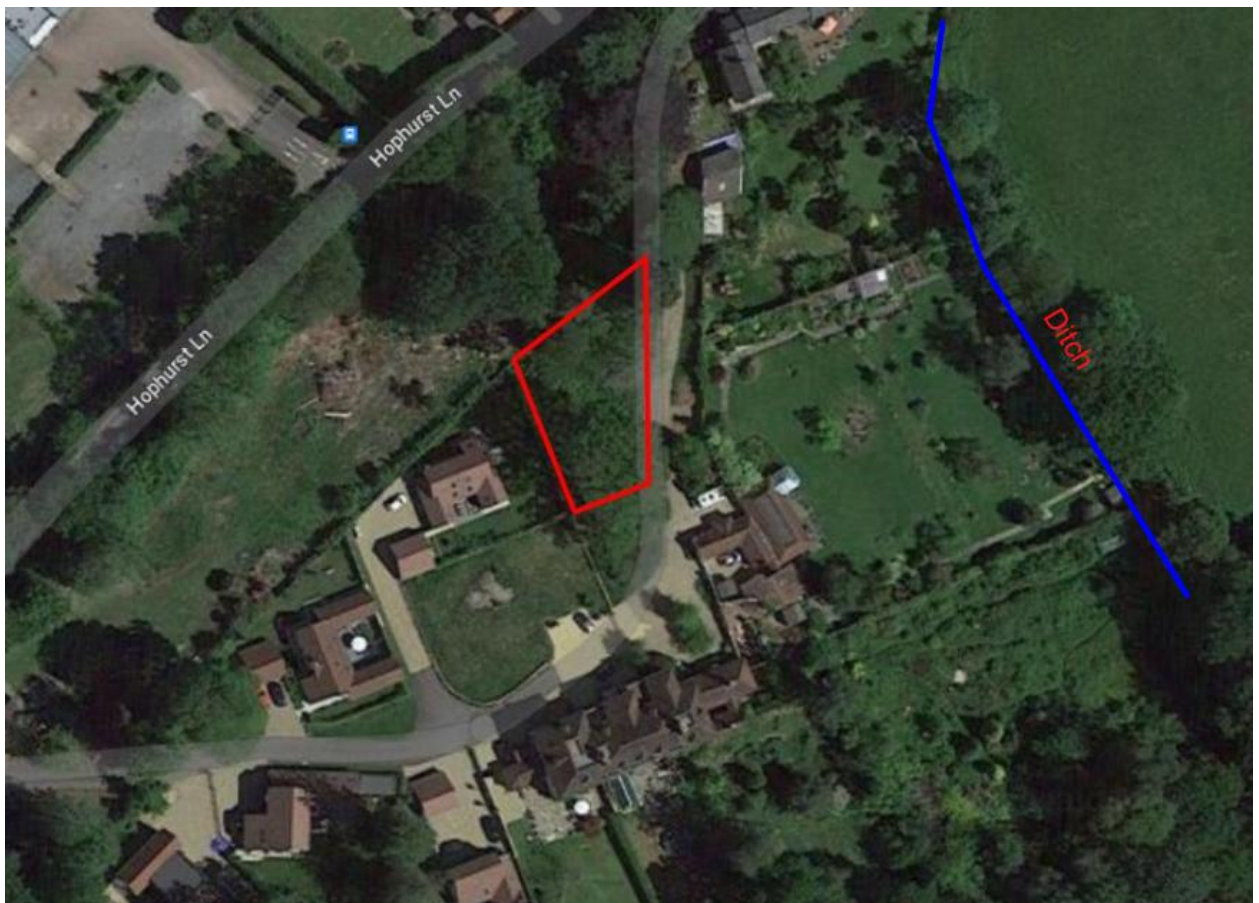
An assessment has been undertaken to determine the hydraulic capacity of the existing ditch to the east of Land at Grid Reference 535270138258, Tiltwood, Hophurst Lane, Crawley Down. The ditch is located along the eastern boundary of the adjacent existing Greensleeves development.

The purpose of this assessment is to demonstrate that the watercourse has sufficient capacity to accommodate the proposed restricted surface water discharge from the proposed single dwelling development without increasing flood risk on-site or downstream.

The assessment has been carried out using Manning's Equation for steady, uniform open channel flow.

2.0 Site Location

The site is located at Grid Reference 535270138258, Hophurst Lane, Crawley Down.



3.0 Surveyed Ditch Geometry

The topographical survey of the ditch confirms the following representative cross-sectional characteristics:

- Bottom width, $b = 0.6 \text{ m}$
- Flow depth assessed, $y = 0.55 \text{ m}$
- Side slope: 1 horizontal : 0.61 vertical

Manning's trapezoidal formula uses side slope as $z = \text{horizontal} : \text{vertical}$

$$z = \frac{1}{0.61} = 1.639$$

- Channel gradient (S): 1 in 92 (10.9 mm/m)
- Manning's roughness coefficient (n): 0.035

The Manning's n value reflects a typical natural earth ditch with moderate vegetation and represents a conservative assumption.

4.0 Methodology

The channel capacity has been calculated using Manning's Equation:

$$Q = \frac{1}{n} A R^{2/3} S^{1/2}$$

Where:

- Q = flow rate (m³/s)
- n = Manning's roughness coefficient
- A = cross-sectional flow area (m²)
- R = hydraulic radius (m)
- S = channel slope (m/m)

The hydraulic radius is defined as:

$$R = \frac{A}{P}$$

Where:

- P = wetted perimeter (m)

5.0 Calculation

5.1 Cross-Sectional Area (A)

For a trapezoidal channel:

$$A = y(b + zy)$$

$$A = 0.55(0.6 + 1.639 \times 0.55)$$

$$A = 0.826 \text{ m}^2$$

5.2 Wetted perimeter (P)

$$P = b + 2y\sqrt{1 + z^2}$$

$$P = 0.6 + 2(0.55)(1.920)$$

$$P = 2.712 \text{ m}$$

5.3 Hydraulic Radius (R)

$$R = A/P = 0.826/2.712$$

$$R = 0.304 \text{ m}$$

5.4 Discharge Using Manning's Equation

$$Q = \frac{1}{n} AR^{2/3} S^{1/2}$$

Substituting values:

$$Q = \frac{1}{0.035} \times 0.826 \times (0.304)^{2/3} \times (0.01087)^{1/2}$$

$$Q \approx 1.11 \text{ m}^3/\text{s}$$

5.5 Theoretical Conveyance Capacity

The existing ditch therefore has a theoretical hydraulic conveyance capacity of approximately:

$$1.11 \text{ m}^3/\text{s}$$

Converting to litres per second:

$$1.11 \text{ m}^3/\text{s} = 1,110 \text{ l/s}$$

6.0 Comparison with Proposed Development Discharge

Existing ditch theoretical capacity: **1,110 l/s**

Proposed additional discharge: **0.5 l/s**

Percentage increase relative to ditch capacity:

$$\begin{aligned} &0.5 / 1110 \times 100 \\ &= 0.045\% \end{aligned}$$

7.0 Conclusions

The existing ditch has a theoretical hydraulic conveyance capacity of approximately 1,110 litres per second under the assessed steady, uniform flow conditions.

The proposed surface water discharge from the single-dwelling development is restricted to 0.5 l/s, which represents less than 0.05% of the calculated theoretical capacity of the ditch.

Given that the proposed surface water discharge is restricted to 0.5 l/s, the additional flow represents a negligible increase in flow relative to the available conveyance capacity of the existing ditch.