

FILE NOTE

PROJECT NUMBER: 2205773

PROJECT NAME : Ford Airfield

DATE : 26/02/2026

SUBJECT : Uplift Calculations

NOTED BY : AD

The proposed ponds are to be lined with pozidrain liner, which is specifically designed to remove the uplift pressure from ponds instead of clay liners with gravel surrounds, to convey flows to a central carrier drain in order to remove uplift from the proposed ponds.

The below calculations show that the peak flows associated with ground water are below the design capacity of the liner and carrier drain system.

A conservative approach has been taken following discussions with the approving team with it assumed that it is a static uplift over the full area of the pond rather than a flow through the area.

We have also assumed that the ground water is to the top of the pond in all areas, which in reality it won't achieve, however the conservative approach was taken to demonstrate the capacity in the proposed system.

The following information was used in the calculations with the data sheet relating to the pozidrain attached.

Hydraulic Conductivity for Clay (K) = 1×10^{-9} Based on BS 8004.

Velocity (v) = K

A = Area of pond within groundwater

Flow Rate Displaced (Q) = V.A (m³/s)

Factor of Safety (Fs) = 2

Displaced Ground Water = Q.Fs

Northern Pond 1

Flow Rate Displaced (Q) = V.A (m³/s)

$$A = 8,041\text{m}^2$$

$$Q = 1 \times 10^{-9} \times 8,041 = 0.0080 \text{ l/s}$$

Factor of Safety = 2

Displace Ground Water inc. factor of safety = 0.016l/s < 100mm dia Carrier pipe capacity 1.994l/s @ 1:1,000

Northern Pond 2

Flow Rate Displaced (Q) = V.A (m³/s)

$$A = 10,523\text{m}^2$$

$$Q = 1 \times 10^{-9} \times 10,523 = 0.0105 \text{ l/s}$$

Factor of Safety = 2

Displace Ground Water inc. factor of safety = 0.021l/s < 100mm dia Carrier pipe capacity 1.994l/s @ 1:1,000

Southern Pond 1

Flow Rate Displaced (Q) = V.A (m³/s)

$$A = 2,047\text{m}^2$$

$$Q = 1 \times 10^{-9} \times 2,047 = 0.0020 \text{ l/s}$$

Factor of Safety = 2

Displace Ground Water inc. factor of safety = 0.004l/s < 100mm dia Carrier pipe capacity 1.994l/s @ 1:1,000

Southern Pond 2

Flow Rate Displaced (Q) = V.A (m³/s)

$$A = 4,228\text{m}^2$$

$$Q = 1 \times 10^{-9} \times 4,228 = 0.0042 \text{ l/s}$$

Factor of Safety = 2

Displace Ground Water inc. factor of safety = 0.008l/s < 100mm dia Carrier pipe capacity 1.994l/s @ 1:1,000

Southern Pond 3

Flow Rate Displaced (Q) = V.A (m³/s)

$$A = 13,308\text{m}^2$$

$$Q = 1 \times 10^{-9} \times 13,308 = 0.0266 \text{ l/s}$$

Factor of Safety = 2

Displace Ground Water inc. factor of safety = 0.016l/s < 100mm dia Carrier pipe capacity 1.994l/s @ 1:1,000

Southern Pond S278

Flow Rate Displaced (Q) = V.A (m³/s)

$$A = 819\text{m}^2$$

$$Q = 1 \times 10^{-9} \times 819 = 0.00082 \text{ l/s}$$

Factor of Safety = 2

Displace Ground Water inc. factor of safety = 0.0016l/s < 100mm dia Carrier pipe capacity 1.994l/s @ 1:1,000

Total Flows To Southern most Outfall = 0.0282l/s

Total Flows To Yapton Lane RAB Outfall = 0.012l/s

Total Flows to Norther Outfall = 0.037l/s

Pond 2 (Northern West Pond)

Flow Rate Displaced (Q) = V.A (m³/s)

A = 759.7 m²

Q = $1 \times 10^{-6} \times 613.4 = 0.76 \text{ l/s}$

Factor of Safety = 2

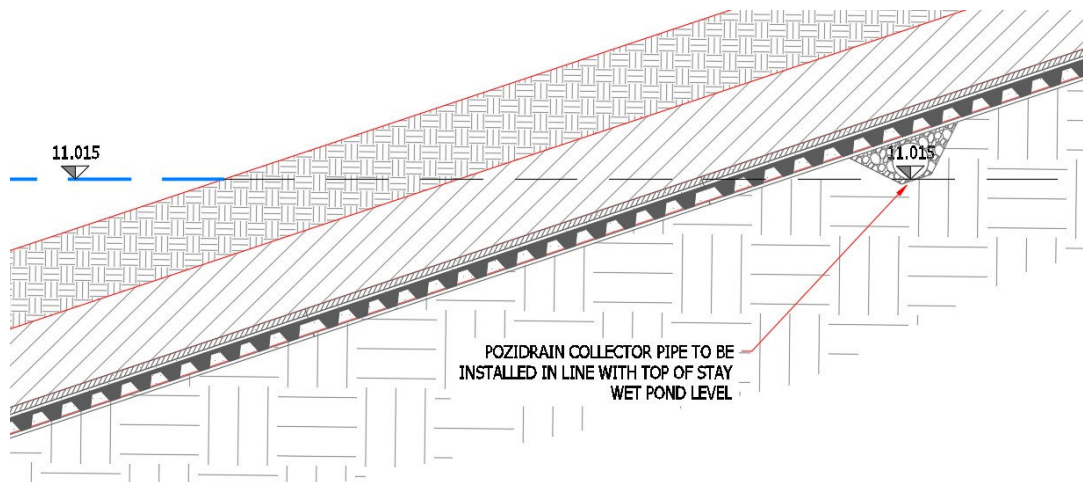
Displace Ground Water inc factor of safety = 1.52l/s < 100mm dia Carrier pipe capacity 1.994l/s @ 1:1,000

Peak flow within Pozidrain membrane

= Displaced Ground Water/2(either side of carrier drain)/Length of carrier drain

= $1.52 / 2 / 39.8$

= 0.019l/s/m < Capacity of Pozidrain = 1.45l/s/m



Pond 3 (Eastern)

Flow Rate Displaced (Q) = V.A (m³/s)

A = 928 m²

Q = $1 \times 10^{-6} \times 928 = 0.928$ l/s

Factor of Safety = 2

Displace Ground Water inc factor of safety = **1.86l/s < 100mm dia Carrier pipe capacity 1.994l/s @ 1:1,000**

Peak flow within Pozidrain membrane

= Displaced Ground Water/2(either side of carrier drain)/Length of carrier drain

= $1.86 / 2 / 40.7$

= **0.022l/s/m < Capacity of Pozidrain = 1.45l/s/m**

