



**BRIGHT PLAN CIVILS**

Project No: D2385  
Project Name: Church Lane, Climping  
Sheet No: 1 (Swale)

**SWALE LINER HYDROSTATIC UPLIFT ANALYSIS FOR SOFT CONSTRUCTION (@BED LEVEL)**

Level Data:

Thickness of surfacing layers above Liner:

Ground Level = 5.7 m  
Depth to Groundwater = 0.75 m  
Invert of Swale = 5.2 m  
Level of Liner = 4.7 m

Topsoil = 0 mm  
40mm stone = 500 mm  
Sand = 0 mm  
**TOTAL = 500 mm**

Depth between  
groundwater & Liner = 0.25 m  
Groundwater level = 4.95 mAOD

**Hydrostatic Uplift** = 2.49 kN/m<sup>2</sup>  
Factor of Safety = 1.1  
**Min' downward force required** = 2.74 kN/m<sup>2</sup>

DMRB, CD 350 (Highway Structures, for Dead loads = 1.32)

Densities:

Top Soil = 15.7 kN/m<sup>3</sup>  
40mm stone = 14 kN/m<sup>3</sup>  
Sand = 14 kN/m<sup>3</sup>

Weight of Topsoil = 0.00 kN/m<sup>2</sup>  
Weight of Clay = 7.00 kN/m<sup>2</sup>  
Weight of Sand = 0.00 kN/m<sup>2</sup>

**Downward force of layers over liner (inc FOS of 0.9) = 6.30 kN/m<sup>2</sup>**

**Make-up over Liner OK**

Anchor Trench:

Dimension =  
Pond area = 0 m<sup>2</sup>  
(Base exl sides)

| Width | Height | Total Length |
|-------|--------|--------------|
| 0     | 0      | 0            |

**Weight of Clay = 0.00 kN**

**Total min downward force required over pond area = 0 kN**

Total downwards force over pond area from layers over liner = 0 kN  
Total downward force from anchor trenches = 0.00 kN

**Total resisting force = 0.00 kN**

**Design Sufficient**