



**RANGER ENGINEERING GROUP, INC.**

130 Main Street Suite 202

Salem, NH 03079

Tel: 978-208-1762

www.rangereng.com

Underground Detention System Buoyancy Calculations

Overall size of detention system = 67' long x 42' wide x 2.5' tall = 7008 cubic feet.

Calculate Uplift

Weight of water displaced = 67' x 42' x 2.5' x 62.4 pounds /cubic foot (weight of water)

Uplift force = 438,984 pounds

Calculate weight of system when system is dry

System uses 190.8 cubic yards of stone. (From Hydrocad Wizard)

Stone voids = 40%.

Convert yards of stone to equivalent volume of solid stone = 190.8 x 0.60 = 114.5 cubic yards

Weight of stone = 114.5 cubic yards x 27 cubic feet / cubic yard = 3,090 cubic feet of stone.

Weight of stone = 3,090 x 150 pounds per cubic foot = 463,644 pounds

**Weight of stone in the system is greater than the weight of water being displaced. The weight of the stone will counteract the uplift force of the water. The system will not float.**

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