

**Aquadam lateral force resistance calculation**

16' dam with 8' back up

**Single dam**

Dam height, h	16 feet	4.9 Meters
height of retained water, d	8.2 feet	2.5 Meters
Temp of water in dam and being retained assumed similar	68 deg F	20 deg C
Density of water, g	62.3 lbs/cuft	998.0 Kg/cuMeter
flow rate normal to dam, v	0 feet/second	0.0 Meters/Second
Contact width across bottom of dam, w	26 feet	7.9 Meters
Coefficient of friction, m	0.14	0.14

Lateral force from flow = $dg v^2/2$	0 lbs/ft dam length	0.0 N/M dam length
Lateral force from static height = $gd^2/2$	2,095 lbs/ft dam length	470.9 N/M dam length
Total lateral force	2,095 lbs/ft dam length	470.9 N/M dam length

Total pressure acting on interior dam membrane contact width, = ghw	25,917 lbs/ft dam length	5826.3 N/M dam length
Flotation force from static height = $gdw/2$	6,641 lbs/ft dam length	1493.0 N/M dam length
Net gravitational force creating friction = $ghw - gdw/2$	19,276 lbs/ft dam length	4333.3 N/M dam length
Frictional force resisting lateral movement	2,699 lbs/ft dam length	606.7 N/M dam length
Factor of safety against lateral displacement	1.29	1.29

**Lateral force resistance with second dam as back up**

Second dam height, h	8 feet	2.4 Meters
Second dam contact width across bottom of dam, w	13 feet	4.0 Meters

Frictional force resisting lateral movement = ghwm	907 lbs/ft dam length	203.9 N/M dam length
Combined frictional force resisting lateral force	3606 lbs/ft dam length	810.6 N/M dam length
Combined factor of safety	1.72	1.72