



Coastal Construction Manual

FORMULA CALCULATOR

11.7 Hydrodynamic Load

γ :		$d_{dyn} =$	ft
C_d :		$f_{dyn} =$	lb/ft
V :		$F_{dyn} =$	lb
g :	32.2 ft/sec ²		
w :			
d_s :			

(flow velocity less than 10ft/sec)

$$d_{dyn} = (1/2)C_d(V^2/g)$$

$$f_{dyn} = \gamma d_s d_{dyn}$$

$$F_{dyn} = f_{dyn}(w)$$

d_{dyn} = equivalent additional flood depth to be applied to the upstream side of the affected structure, in feet

f_{dyn} = equivalent hydrostatic force per unit width (lb/ft) due to low-velocity flow acting at the point 2/3 below the still water surface of the water

F_{dyn} = total equivalent lateral hydrostatic force in lb acting at the point 2/3 below the stillwater surface of the water

V = velocity of water in ft/sec (see Formula 11.2)

g = acceleration due to gravity (32.2 ft/sec²)

C_d = drag coefficient (recommended values are 2.0 for square or rectangular piles and 1.2 for round piles, or from Table 11.2 for larger obstructions)

γ = specific weight of water (62.4 lb/ft³ for fresh water and 64.0 lb/ft³ for salt water)

d_s = design stillwater flood depth in feet

w = width of structure in feet