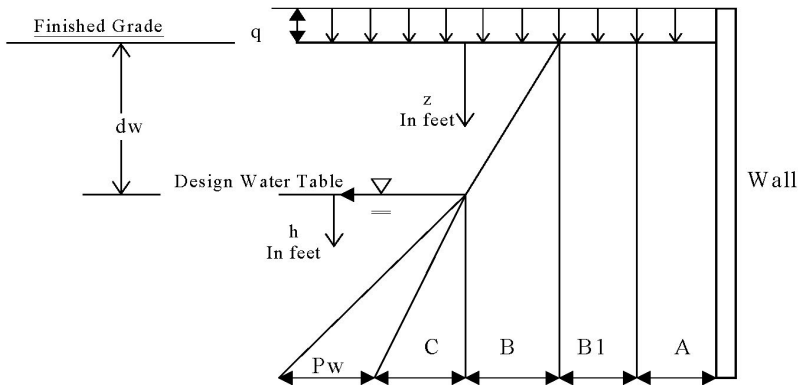
Passive Earth Pressure on 1 foot wide vertical strip



A = 1.47 (q) = Effect of uniform full coverage surface surcharge = 367.5 for example surcharge of 250 psf

B1 = 3346 psf = Passive earth pressure at ground surface due to soil cohesion

B = 194 (z) = Passive earth pressure above water table

C = 102.3 (h) = Passive earth pressure increment below water table

Pw = 62.4 (h) = Hydrostatic pressure increment

Pp = A + B1 + B = Passive lateral earth pressure above water table ($z \leq dw$)

Pp = A + B1 + 194 (dw) + 102.3 (h) + 62.4 (h) = Passive lateral earth pressure below water table, ($z > dw$); h = z-dw

Conditions on information:

- Units of pressure = lbs/ft²
- A surcharge value, q, of 250 lbs/ft² is used as an example only; actual value must be provided by designer.
- Backfill of borrow soil meeting Class I properties as defined in FSAR, 1986 compacted to 95% MDD by ASTM D698
- No factors included
- γs = 132 lbs/ft³ = saturated unit weight of backfill above water table based on 95% Maximum dry density at 2% above optimum moisture
- γ = 69.6 lbs/ft³ = submerged soil density
- ϕcu = 11 deg = angle of internal friction of soil (95% Maximum dry density at 2% above optimum moisture; total stress)
- Kp = 1.47 = Coefficient of passive earth pressure due to Ø (Rankine equation)
- Ccu = 1380 psf = shear strength intercept of soil (total stress, saturated CU test)
- Plane strain conditions (corner adjustment factors not included)
- Dynamic soil pressure not included

FIGURE 2.5-361
Static Lateral Passive Pressures, on 1-Ft. Wide Vertical Strip, on Nuclear Island Below-Grade Walls