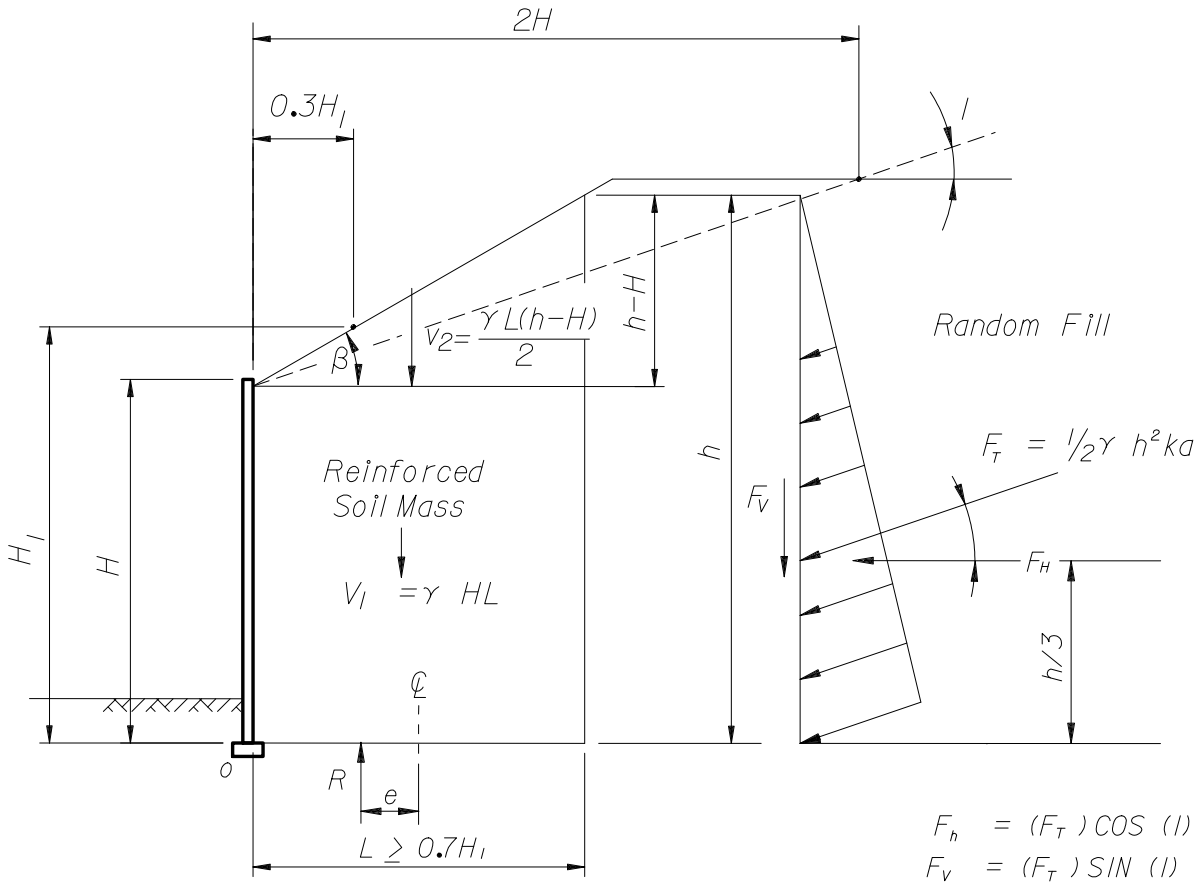
Figure 3-17 Broken Back Backfill without Traffic Surcharge



$F_h = (F_T)\,COS\,(I)$

$F_V = (F_T)\,SIN\,(I)$

For Infinite Slope $I = \beta$

$$H_1 = H + \frac{(Tan\beta)\,0.3H}{(1-0.3\ Tan\ \beta)} \qquad \text{(Mechanical Height)}$$

K_a For Random Fill: $\quad K_a = COS\,(I)\left[\dfrac{COS\,(I) - \sqrt{COS^2 I - COS^2\phi}}{COS\,(I) + \sqrt{COS^2 I - COS^2\phi}}\right]$

SAFETY FACTOR AGAINST OVERTURNING (MOMENTS ABOUT POINT O):

$$S.F.(O) = \frac{\sum Moments\ Resisting\ (Mr)}{\sum Moments\ Overturning\ (Mo)} = \frac{V_1(L/2) + V(2L/3) + F_V(L)}{F_H\ (h/3)} \geq 2.0$$

SAFETY FACTOR AGAINST SLIDING:

$$S.F.(S) = \frac{\sum Horizontal\ Resisting\ Force\ (s)}{\sum Horizontal\ Driving\ Force\ (s)} = \frac{R\ Tan\ \phi}{F_H} \geq 1.5$$

ϕ = Friction Angle of Back fill or Foundation, Whichever is lowest.

$$e = \frac{L}{2} - \frac{Mr - Mo}{R} \leq \frac{L}{6} \qquad \sigma v = \frac{R}{L - 2e}$$

Where: e = Eccentricity R = Resultant of Vertical forces $V_1 + V_2 + F_V$

BROKEN BACK BACK FILL CASE WITHOUT TRAFFIC SURCHARGE