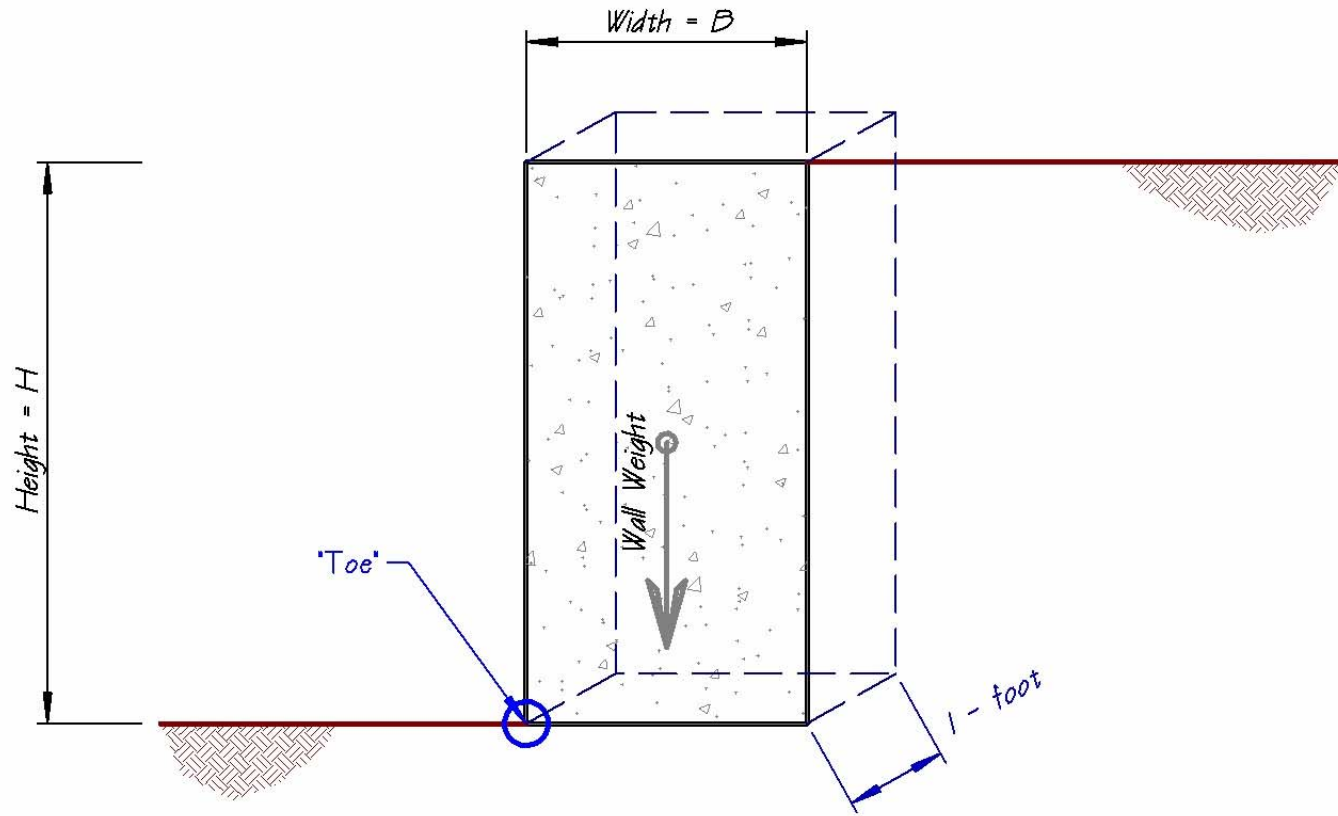
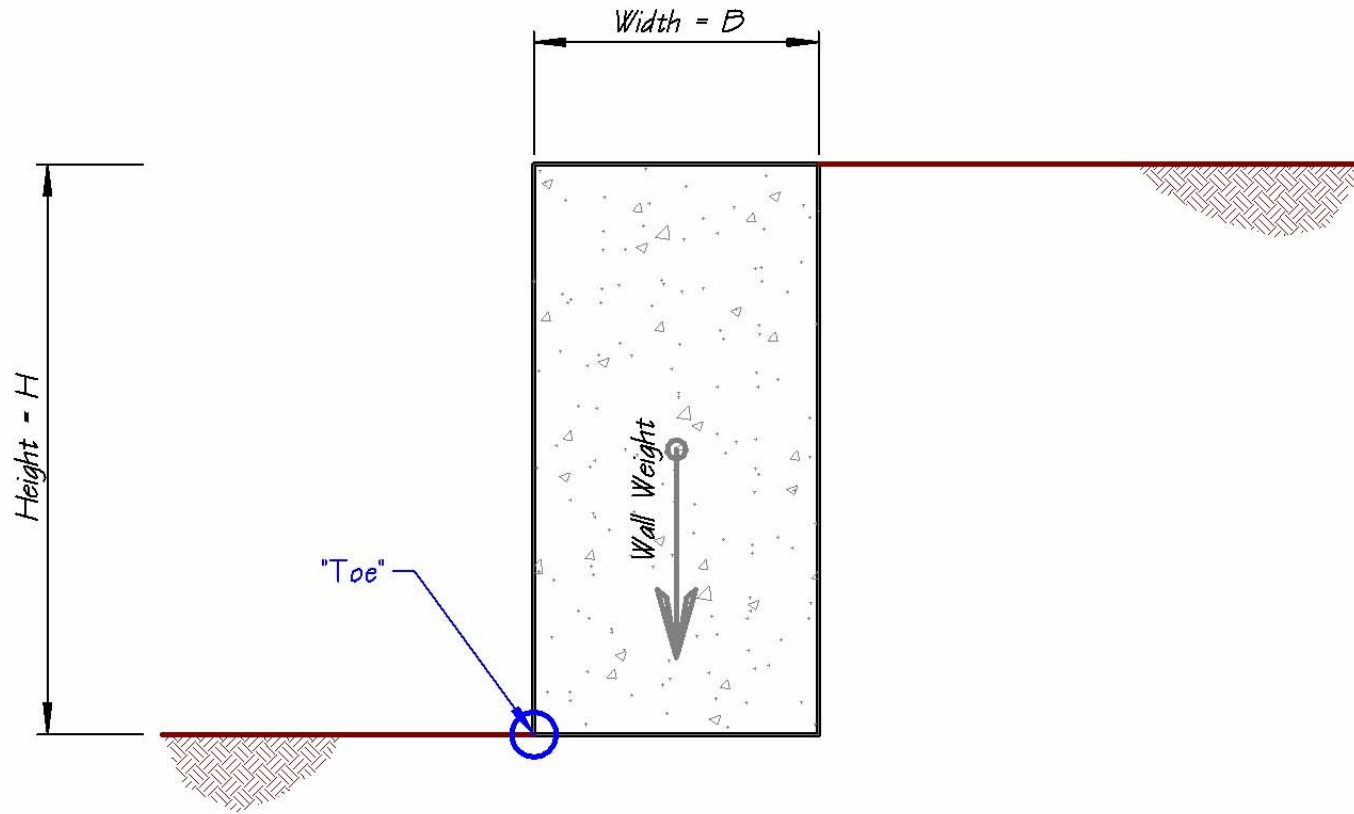


# Retaining Wall

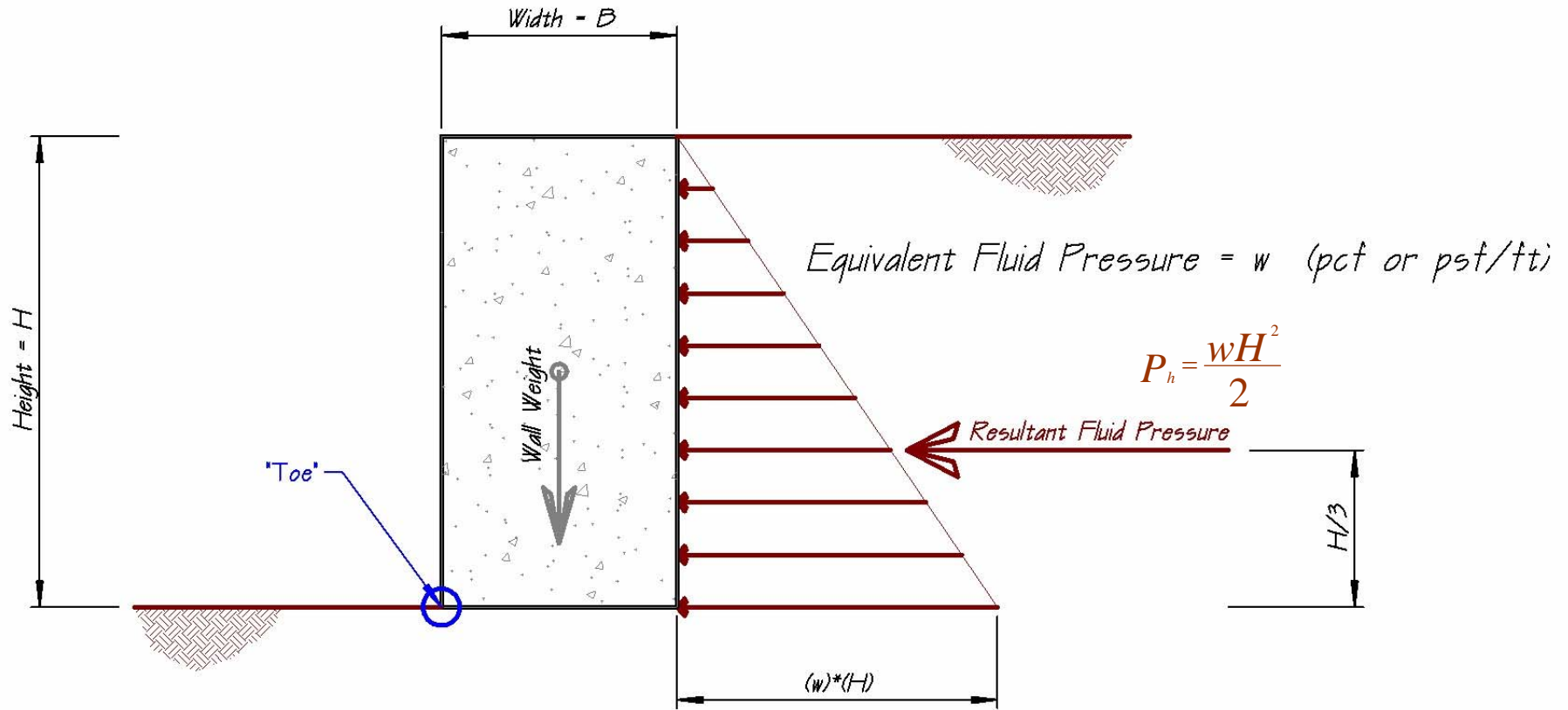
Design:  
Overturning  
Sliding



- The wall will be checked using a section that is 1-foot wide.

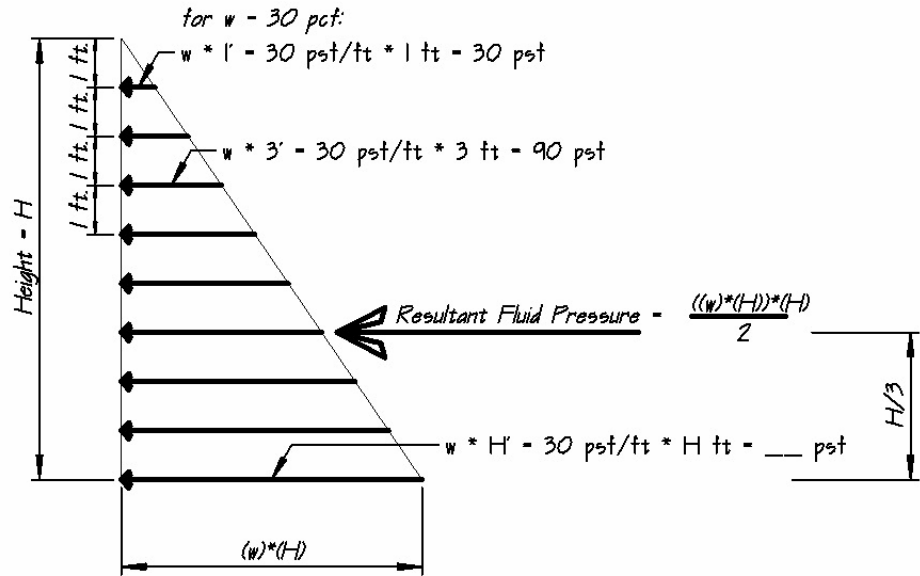
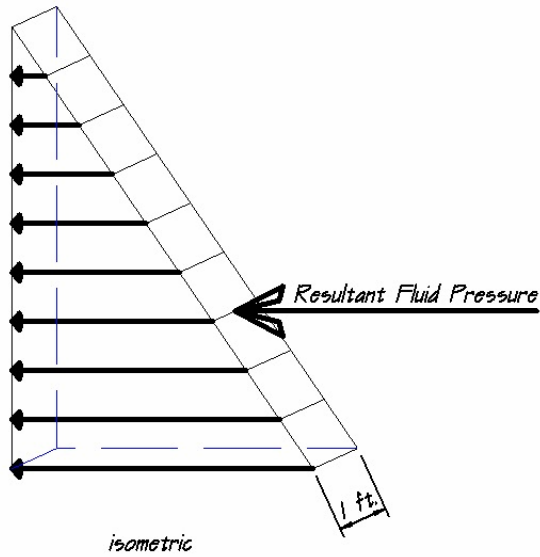


- ...Look at the wall for a 1-foot section...
- Add the force from the soil on the wall
  - Assume an equivalent fluid pressure...



- Assume the soil pressure acting on the wall as an equivalent fluid ...
  - The resulting pressure varies with the height of the wall
  - The “Resultant Fluid Pressure” is equal to the area of the triangular pressure diagram.

Equivalent Fluid Pressure =  $w$  (pcf or psf/ft)



**EQUIVALENT FLUID SOIL PRESSURE  
APPLIED TO A RETAINING WALL**

•Remember....

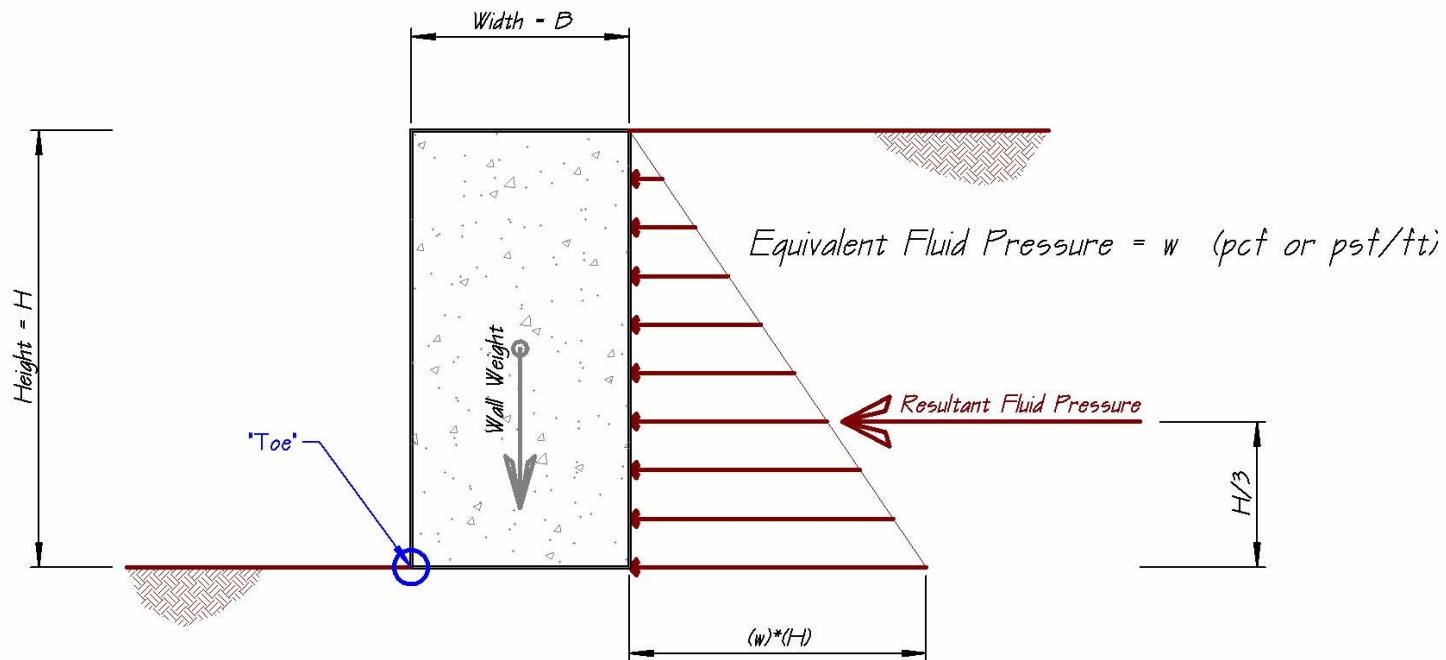
•We are using a section that is 1-foot wide.



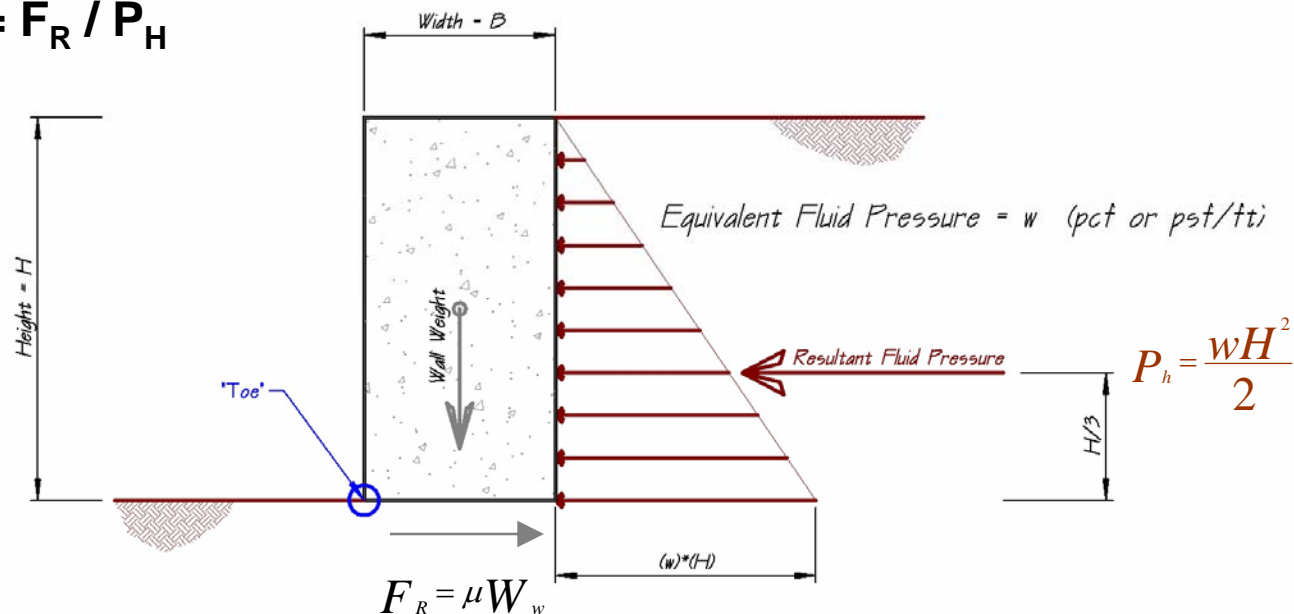
○ Factor of Safety for Overturning:  $FS_o$

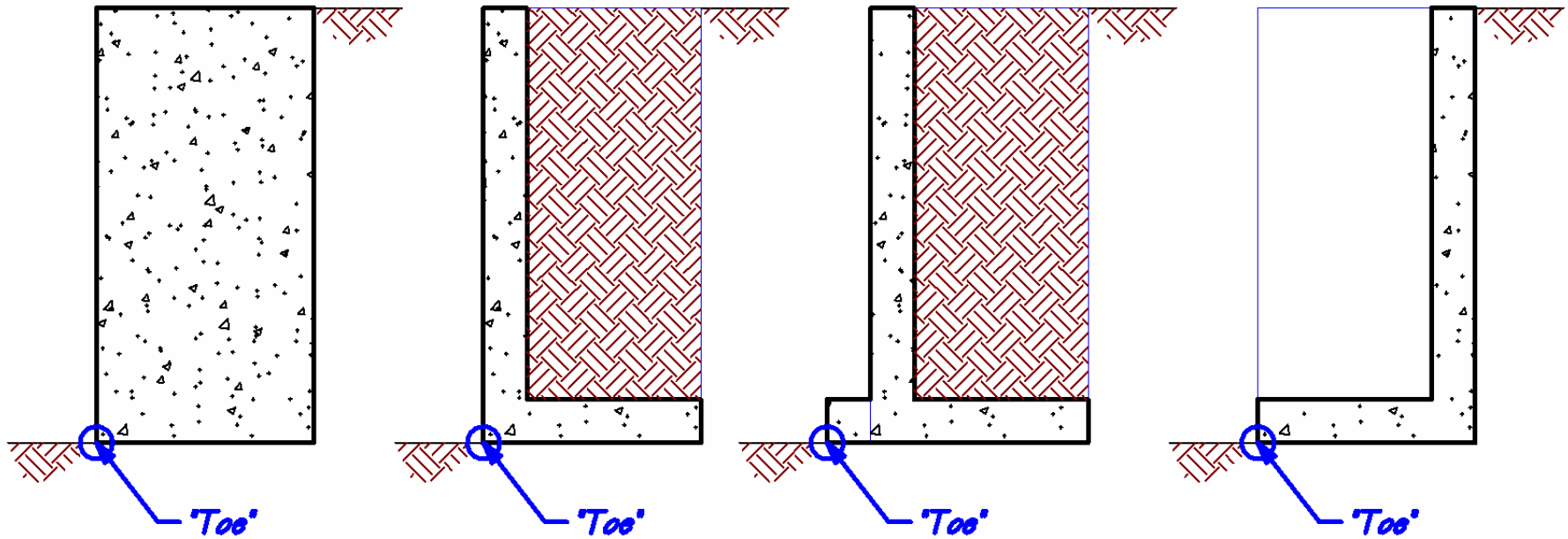
○  $FS_o = M_R / M_O$

○ (Restoring Moment) / (Overturning Moment)



- Factor of Safety for Sliding:  $FS_S$
- Force Causing Wall to Slide
  - Resultant Fluid Pressure:  $P_H$
- Force Resisting Wall Sliding
  - Wall Weight:  $W_W$
  - Coefficient of Friction between the Wall and the Soil:  $\mu$ 
    - From IBC Table 1804.2
  - Resisting Force:  $F_R = (W_W)(\mu)$
- $FS_S = F_R / P_H$





- **The type of Wall affects:**
  - **Cost**
  - **Overturning Safety Factor**
  - **Sliding Safety Factor**