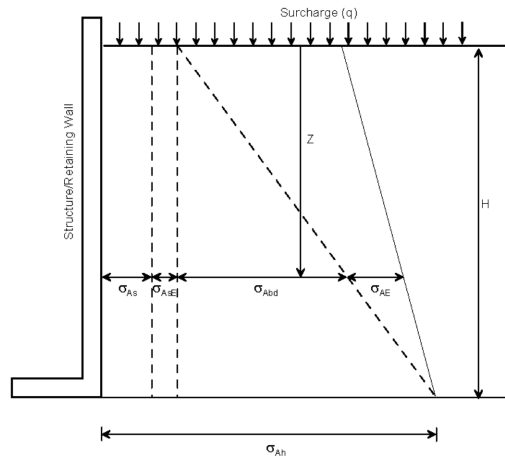


**Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application
Part 2, FSAR**

Active Earth Pressure including Seismic Component



$$k_A = \tan^2(45 - \frac{\phi'}{2}) \cong 0.307$$

Static active earth pressure coefficient

$$\Delta K_{AE} = K_{AE} - k_A \cong 0.052$$

Seismic active earth pressure coefficient

$$\sigma_{As} = k_A q \cong 0.307q$$

Static lateral pressure due to surcharge

$$\sigma_{Abd} = k_A \gamma_t Z \cong 38.41Z$$

Static lateral pressure due to backfill

$$\sigma_{AsE} = \Delta K_{AE} q \cong 0.052q$$

Seismic lateral pressure due to surcharge

$$\sigma_{AE} = \Delta K_{AE} \gamma_t (H - Z) \cong 6.5(H - Z)$$

Seismic lateral pressure due to backfill

$$\sigma_{Ah} = \sigma_{As} + \sigma_{AsE} + \sigma_{Abd} + \sigma_{AE}$$

Static plus seismic active horizontal pressure

Notes:

- Units: lbs/ft² for pressure and ft for dimensions.
- Assumed compacted backfill properties:
 - Total unit weight: $\gamma_t = 125 \text{ lbs/ft}^3$
 - Internal effective friction angle: $\phi' = 32^\circ$
 - Effective cohesion intercept: $C' = 0$
- Hydrostatic pressure is not included because adequate wall drainage is provided.
- Compaction earth pressure is not included based on the assumption that light compaction equipment is used for compaction of soil adjacent to below-grade walls.

Figure 2.5.4-242 Active Earth Pressure