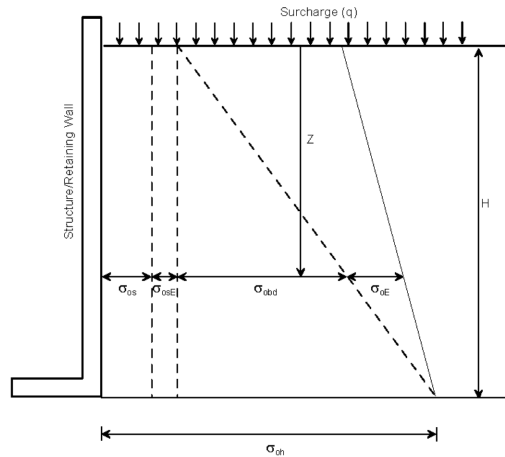


**Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application
Part 2, FSAR**

At-rest Earth Pressure including Seismic Component



$$k_o = 1 - \sin \phi' \cong 0.47$$

Static at-rest earth pressure coefficient

$$\Delta K_{oE} = 2K_h \cong 0.17$$

Seismic at-rest earth pressure coefficient

$$\sigma_{os} = k_o q \cong 0.47q$$

Static lateral pressure due to surcharge

$$\sigma_{obd} = k_o \gamma_t Z \cong 58.8Z$$

Static lateral pressure due to backfill

$$\sigma_{osE} = \Delta K_{oE} q \cong 0.17q$$

Seismic lateral pressure due to surcharge

$$\sigma_{obE} = \Delta K_{oE} \gamma_t (H - Z) \cong 21.25(H - Z)$$

Seismic lateral pressure due to backfill

$$\sigma_{oh} = \sigma_{os} + \sigma_{osE} + \sigma_{obd} + \sigma_{obE}$$

Static plus seismic at-rest 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 2.5.4-243 At-rest Earth Pressure