

# Chapter 8

## CONCLUSIONS

This paper studies the earth pressure at-rest near a vertical rock face. Based on the experiment results, the following conclusions can be drawn.

A. For loose sand:

1. The distribution of horizontal earth pressure obtained for  $d = 1500$  mm is in good agreement with Jaky's and Spangler and Handy's solutions.
2. For the spacing between the wall and the rock  $d = 1100$  mm to  $d = 500$  mm, the distribution of horizontal pressure is in fairly good agreement with Janssen's prediction.
3. When the spacing  $d$  is very small ( $d \leq 300$  mm), the measured earth pressure  $p_h$  is even lower than Rankine's active pressure and appears not to change with depth.
4. The horizontal earth pressure  $p_h$  decreases with decreasing spacing  $d$ . Jaky's solution can be considered as the upper bound for estimating earth pressure near a vertical rock face.
5. Janssen's method provides the best estimation for  $K_{o,h}$  coefficient under different wall-rock face spacing  $d$ .
6. As for the factor of safety against overturning, Janssen's prediction is the best method to estimate the overturning moment ( $M_o$ ) about the wall base.

B. For compacted sand:

1. The lateral stress measured near the top is almost identical to the passive earth pressure estimated with Rankine theory.
2. With the decrease of spacing  $d$ , the extra pressure inducing by compaction  $\Delta p_{h,ic}$

measured increases near the top of the wall increases.

3. Below the effective compaction depth, the measured  $\sigma_h$  is in general lower than Jaky, Janssen, Reimbert and Reimbert, and Spangler and Handy's predictions.
4. The pressure coefficient  $K_{o,h}$  decreases with the decreasing of spacing  $d$ . None of the theories provide a good estimate of  $\sigma_h$  acting on a retaining structure with compacted backfill. Because these theoretical equations did not considered the effects of compaction.
5. Due to the effect of compaction, the earth pressure coefficient  $K_{o,h}$  is almost doubled from the  $K_{o,h}$  value for loose sand.

