AD FALCON API Manual

Input File Names

Javad Ghorbani

March 26, 2026

Contents

1 Input File Names

- Mohr vs Prandlt

1.1 Problem Setup

- **Geometry:** Plane strain condition, $5\,\text{m} \times 5\,\text{m}$, with a total model width of $1\,\text{m}$.
- **Boundary Conditions:** Subjected to a **rigid displacement** at the top boundary to induce settlement.
- **Material Properties:**
  - Young's Modulus to undrained shear strength ratio: $E/c_u = 100$,
  - Poisson's ratio: $\nu = 0.499$ (near incompressibility),
  - Internal friction angle: $\phi = 0^\circ$,
  - Dilation angle: $\psi = 0^\circ$,
  - Undrained shear strength: c_u (constant).

The goal is to compare the the average fooritng pressure beneath the rigid displacement with Prandtl solution from plasticity theory for plane strain conditions:

$$\sigma_p = (2 + \pi)c_u \approx 5.14c_u \tag{1}$$

where:
- σ_p = plastic limit pressure,
- c_u = undrained shear strength of the soil.

This theoretical value provides a benchmark to evaluate the results obtained from numerical simulations.

1.2 Results Visualization

Below is the comparison of the average normalized pressure distribution and deformed mesh for the conducted analysis:

The numerical results show roughly 5% disagreeemnt with the Prandlt solution.

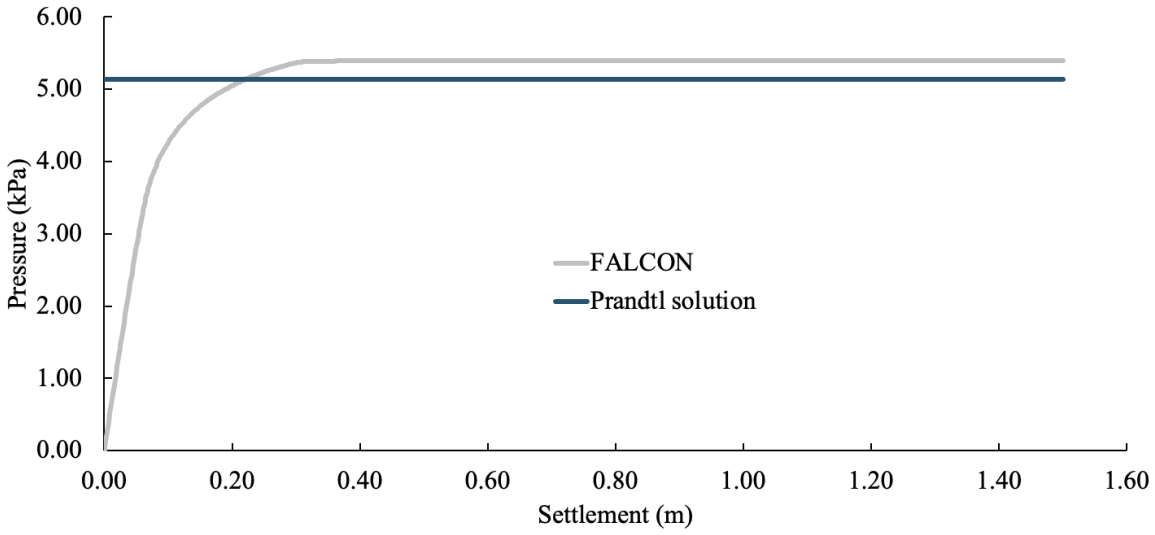

Figure 1: Small Deformation Results