University of Massachusetts, Amherst
Department of Civil & Environmental Engineering
CEE/MIE 630: Advanced Solid Mechanics

Homework #3: Due October 8

GRADED:

Problem 1: Consider the solid shown below that is loaded by a uniform pressure $p$ and is fully constrained between the frictionless walls as shown:
(a) Write down the traction and displacement boundary conditions.
(b) Compute the stress and strain components for the case of plane stress.
(c) Compute the total volume change.

UNGRADED:

Problem 2: Solve Problem 1 for the case of plane strain.

Problem 3: Consider the displacement field

\begin{align}
  u(x, y) &= c_1 y + c_2 x \\
  v(x, y) &= c_3 x + c_4 y
\end{align}

with $c_1 = 1e - 3$, $c_2 = -1e - 3$, $c_3 = -2e - 3$, $c_4 = 1e - 3$.
(a) Compute the strains
(b) Compute the stresses
(c) Check compatibility and equilibrium