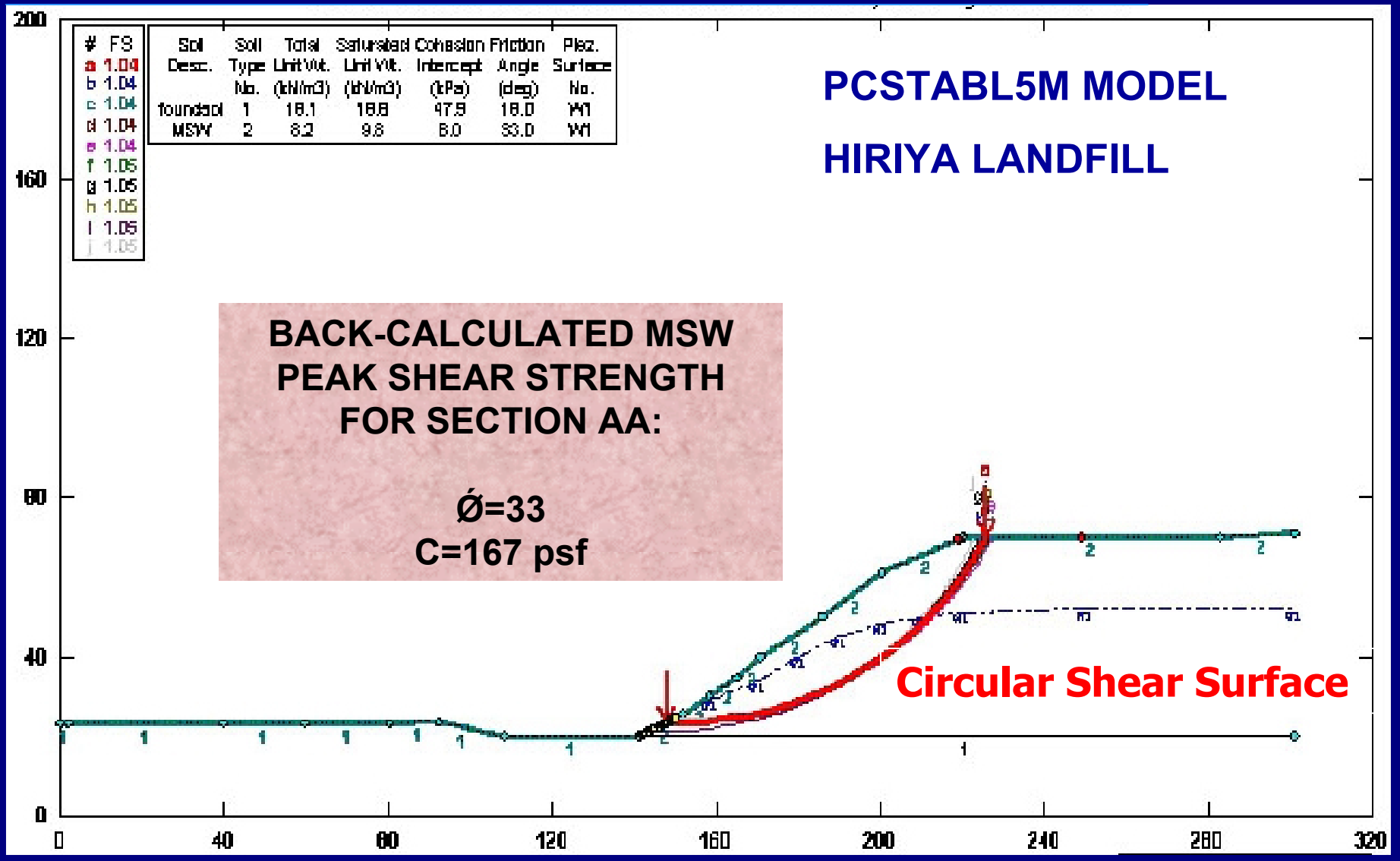
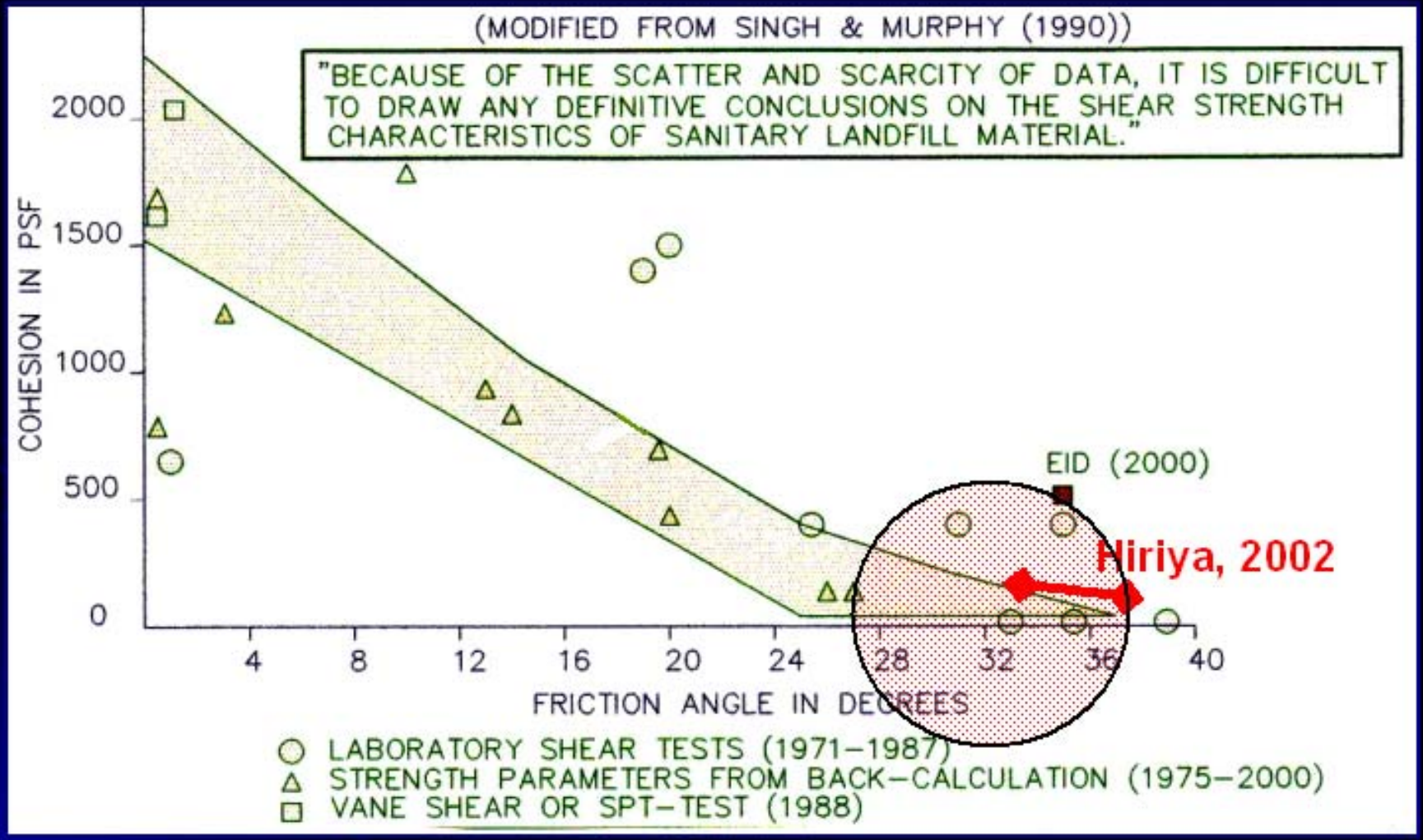
Temporarily.

Hiriya Landfill Slope Failure (1997)

MSW Strength - Method 3
Based on Back-calculation



Back Calculated Shear Strength Hiriya LF- wet, decomposed MSW



LANDFILL BIOREACTORS

Modified Traditional Approach:

"What is the Goal of Your Bioreactor?"

- 1. Increased waste density - (measurable ±15%)
  - Increased moisture content
  - Compression, settlement
  - Ravelling (particle re-orientation)
  - Decomposition of organics
- 2. Change in waste shear strength - ?
  - Density increase vs. decomposition
  - Pore pressures (liquid build-up)
  - Preferential shear surfaces

In-Place Density Factors

- γ_{wet} = actual in place density

  Increases with overburden pressure
  - " with compactive effort
  - " with soil daily cover
  - " with time and settlement
  - " with moisture content addition

Cumulative effects significant

~40% to >70%

1000 pcy waste will increase to 1400 - 1700 pcy

Example calculation

Initial Condition:

γ_{wet} = 1000 pcy @ w=25% (250# water/cy)
Alternative Daily Cover (intermediate cover soil only)

Moisture Addition:

To achieve w=40%=> 250# water/cy (30 gal)
New γ_{wet} = 1250 pcy (assumes no by-pass)

Settlement (compression) + Decomposition = 20%

New γ_{wet} = (1250 pcy)/(0.80) = 1562 pcy

Net Density Increase = (1562-1000)/(1000) => **56.2%**