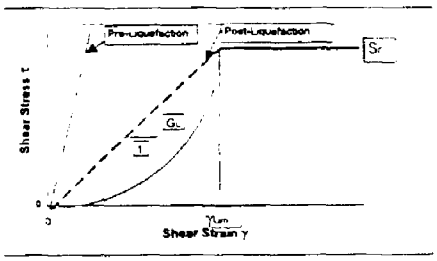


Fig. 13a Linear and Non-linear Stress-Strain Mode (Byrne el at.)

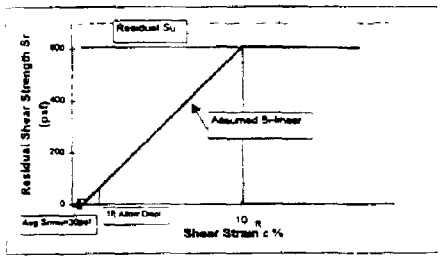


Fig. 13b Liquefied Sand Lateral Displacement Relationship Assumed in Stability Studies

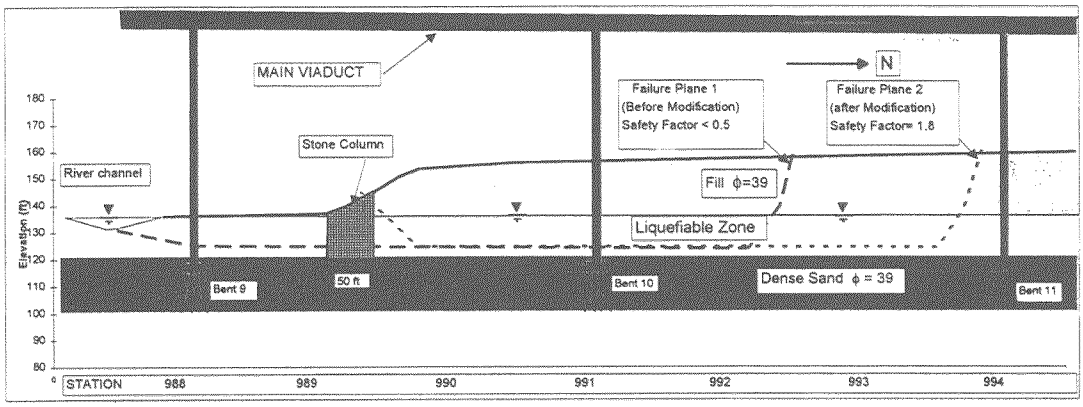


Fig. 14 Soil Profile Beneath Main viaduct (North Side) Illustrating Before and After Ground Modification Safety Factors Against Displacement < 1.0 ft

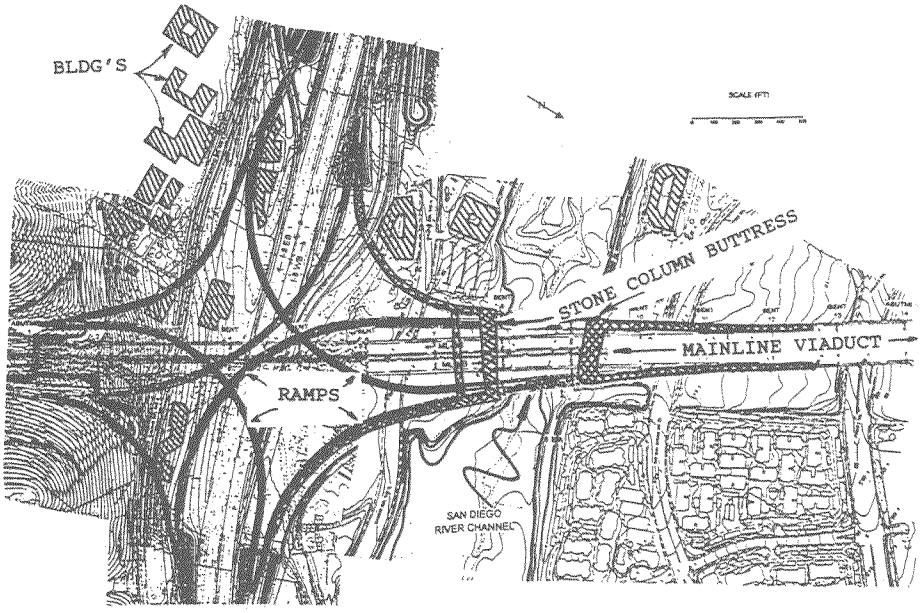
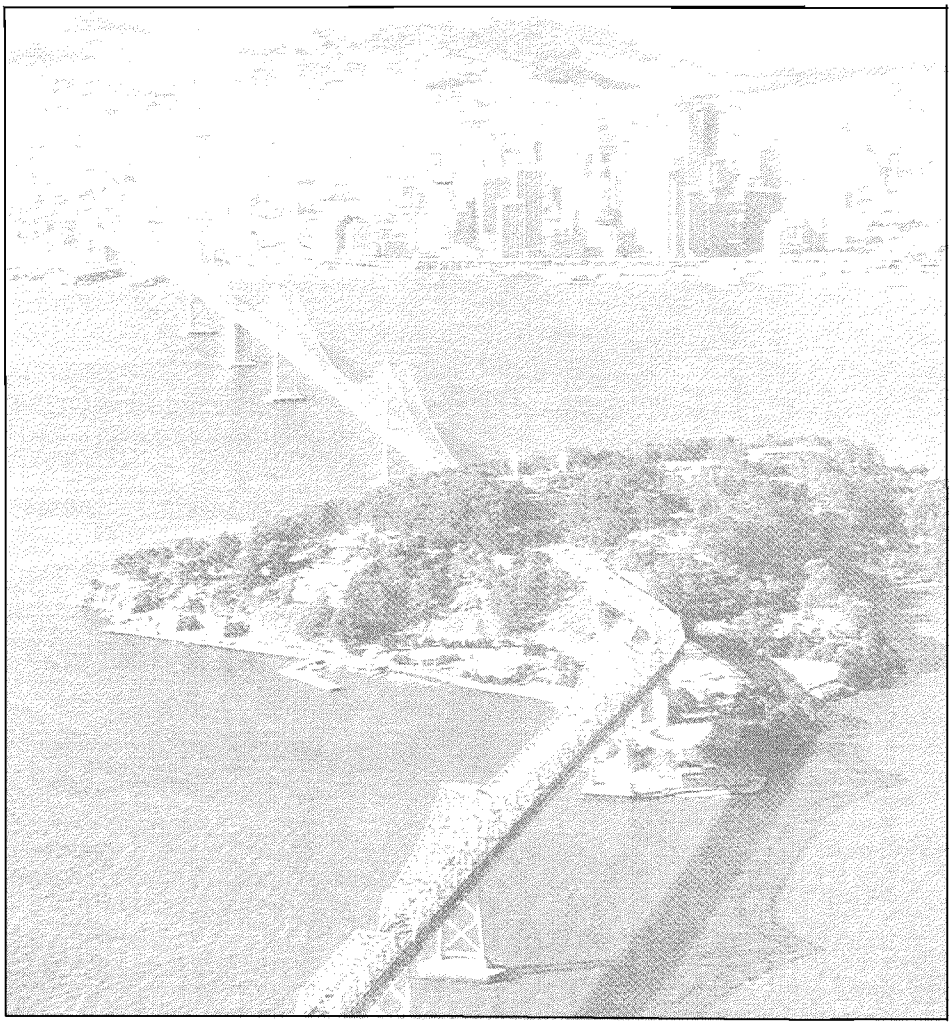


Fig 15 Plan View of I-8/805 Interchange Showing Location of Underground Stone Column buttress



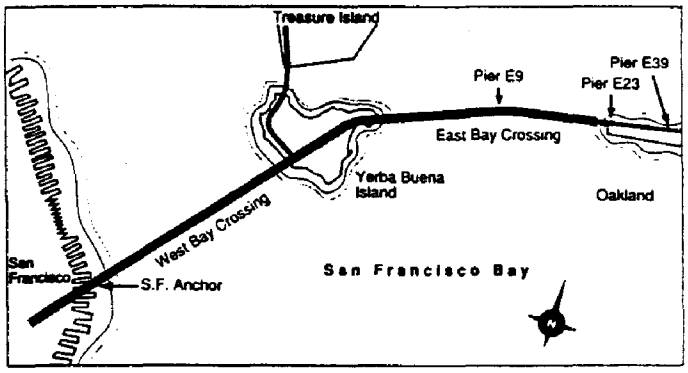


Fig. 16 Plan and Aerial View of the San Francisco-Oakland Bay Bridge

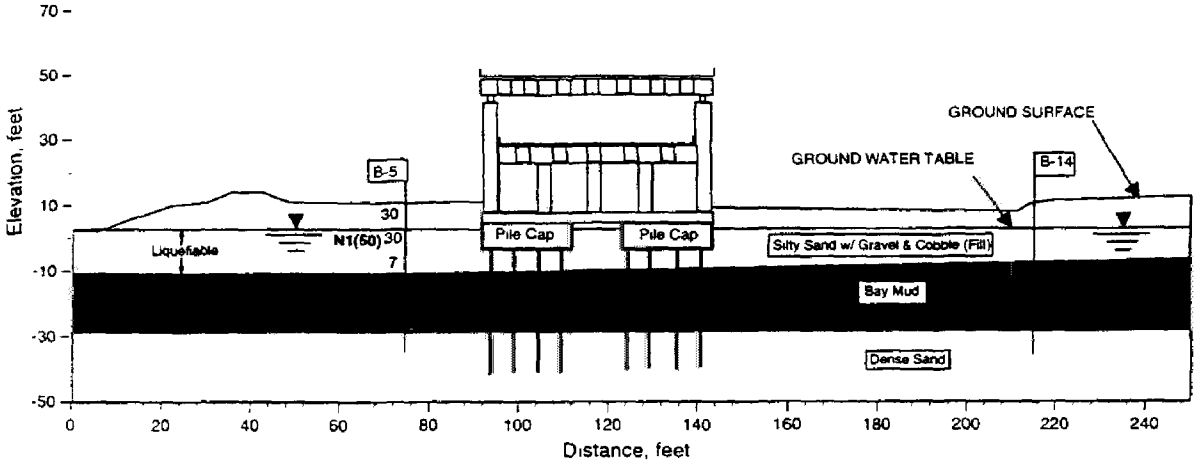


Fig 17 San Francisco - Oakland Bay Bridge east approach cross section (typical).

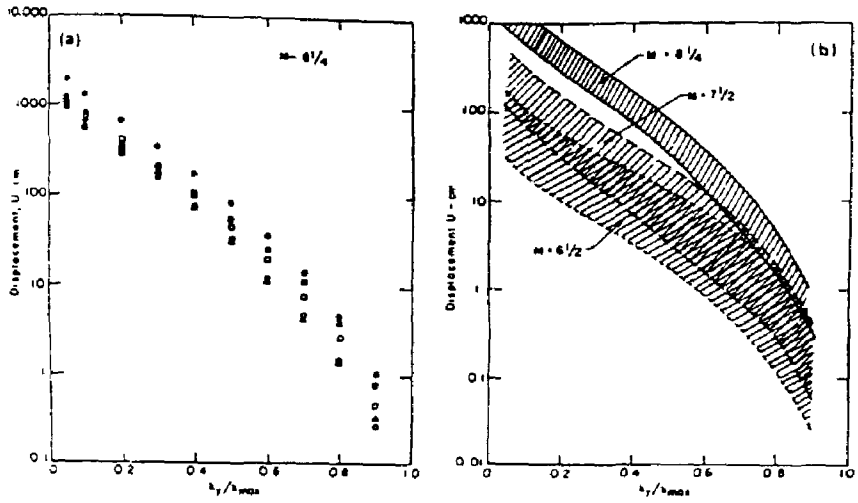


Fig. 18 Permanent Displacement From Sliding Block Analyses: (a) Results Obtained Using Several Input Ground Motions, Typical of Earthquakes With Magnitude 8.25; (b) Summary of Results From Different Magnitudes of Earthquake
Source: Makdisi and Seed (1978)

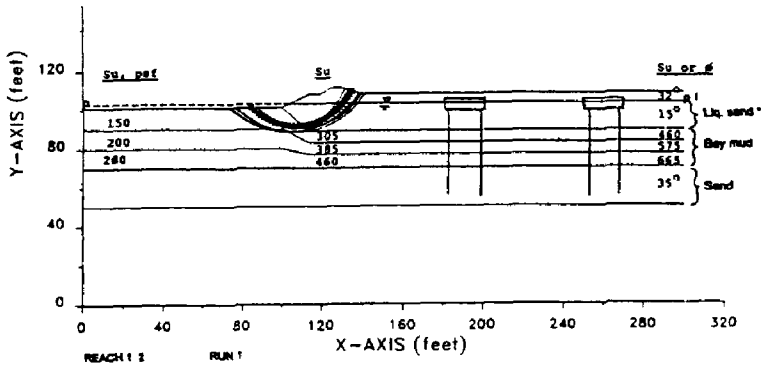


Fig. 19a Onginal strengths, earthquake time cycle 0 - 2.
(Ky = 0.03, Kmax = 0.5, Dy disp ~ 10')

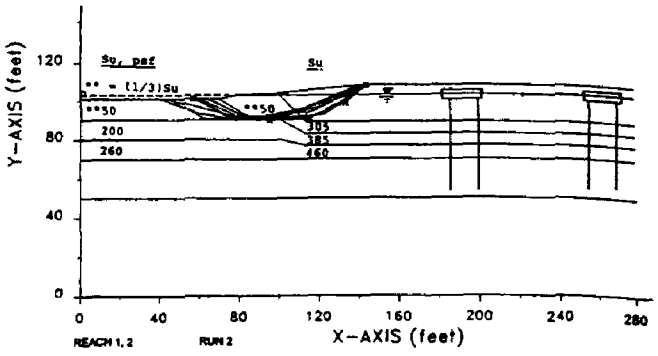


Fig. 19b Modified strengths, earthquake time cycle 2 - 4
(Ky = 0.03, Kmax = 0.45, Dy disp ~ 3')

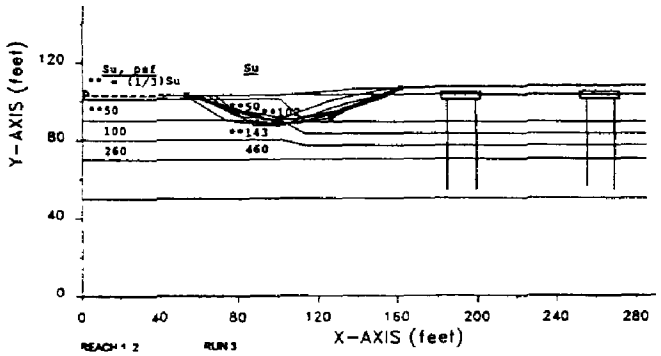


Fig 19c Modified strengths, earthquake time cycle 4 - 6
(Ky = 0 06, Kmax = 0 35, Dy disp ~ 1')

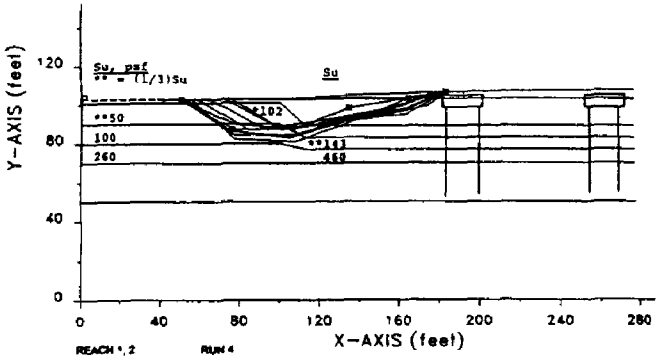


Fig. 19d Modified strengths, earthquake time cycle 6 - 8.
(Ky = 0.06, Kmax = 0.25, Dy disp ~ 0.6')

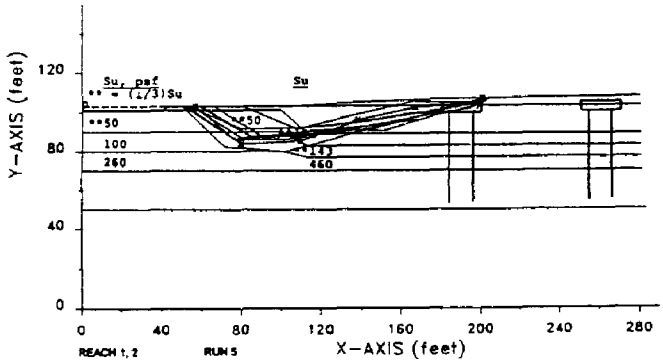
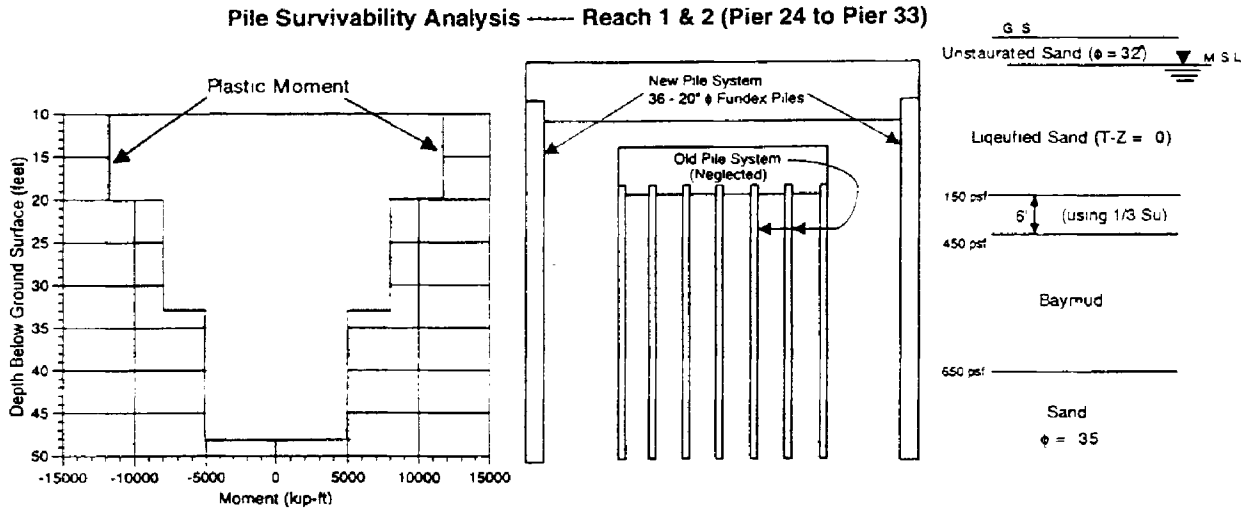


Fig 19e - Modified strengths. earthquake time cycle 8 - 10.
(Ky = 0 08, Kmax = 0.15, Dy disp ~ 0 1')

Fig. 19 Progressive failure analysis of liquefied sand and softened bay mud for east approach to Bay Bridge



Substructure System Loading and Analysis (three cases evaluated)

Axial 3240 kips compression
Column Shear 1725 kip (peak)
Moment 13,000 kip-ft

Case 1	Case 2	Case3
Driving Force a. 1/2 Pp over full cap length and pile system b 1/2 inertial load and full axial load c 7 ft unsaturated fill (ϕ= 32) and 14 ft liq sand (ϕ= 20)	Same as Case 1 except ϕ=0 and Sr=300 psf for liq sand Δl=0 8 in and Δt=1 2 in	Same as Case 2 except full Pp Δl=1 3 in and Δt=1 8 in
Resisting Force a using Sr=200 psf p-y for liq sand b using 1/3 Su p-y for 6 ft baymud below the liq sand c full Pa on cap and pile system		
Peak Pile Cap Displacement Δl=0.5 in (longitudinal) and Δt=0 9 in (transverse)		

Fig. 20 Typical Components included in Analysis of New Pile System
(Analysis Involved Studying Three Possible Scenarios for Soil Loading)