

Introduction to Geotechnical Engineering (cont'd)



ground

Mining



Mining



An open pit mine

Blasting



For ore recovery in mines



Earthquake Engineering



Loma Preita Earthquake, San Francisco (1989)

Ground Improvement



Impact Roller to Compact the Ground

Ground Improvement



Sheepsfoot Roller to Compact Clay Soils

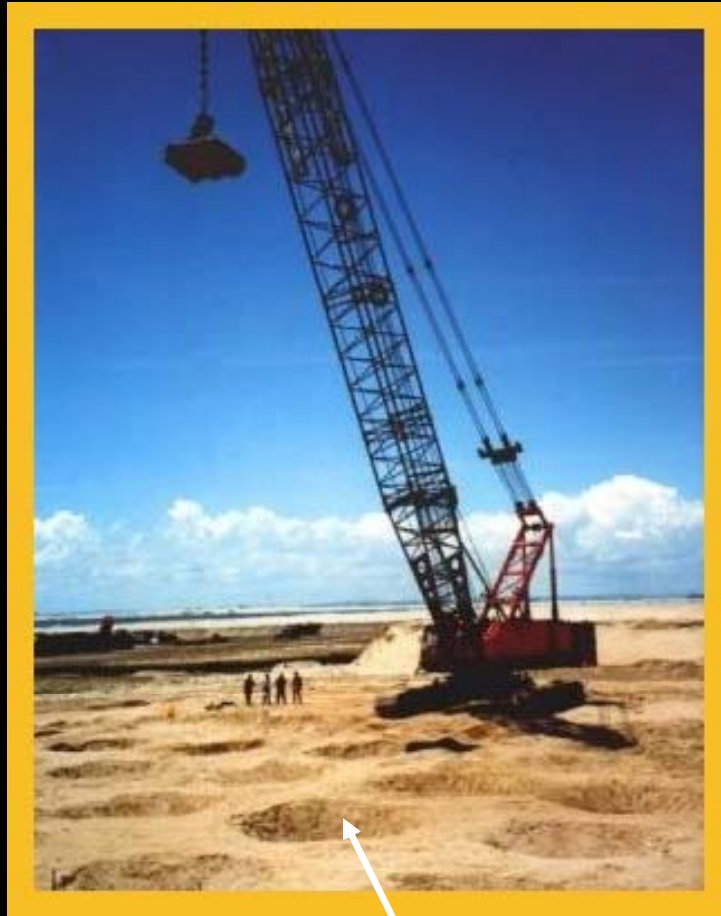
Ground Improvement



Smooth-wheeled Roller

Ground Improvement

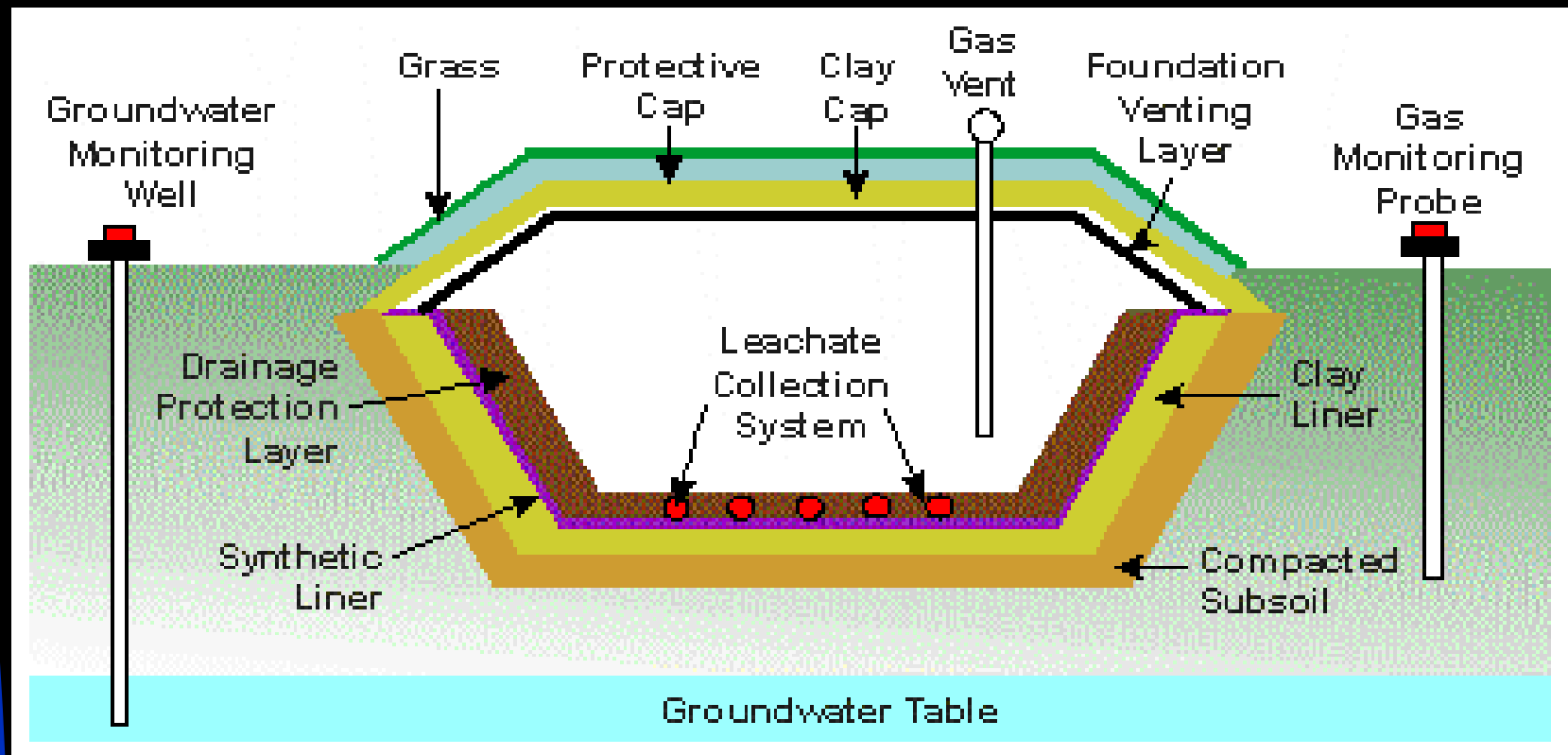
Big weights dropped from 25 m, compacting the ground.



Craters formed in compaction



Environmental Geomechanics



Waste Disposal in Landfills

Typical Safety Factors

Type of Design	Safety Factor	Probability of Failure
Earthworks	1.3-1.5	1/500
Retaining structures	1.5-2.0	1/1500
Foundations	2.0-3.0	1/5000

Dynamic Compaction



JCU site visit to Townsville Port in 2003

Soil Nailing



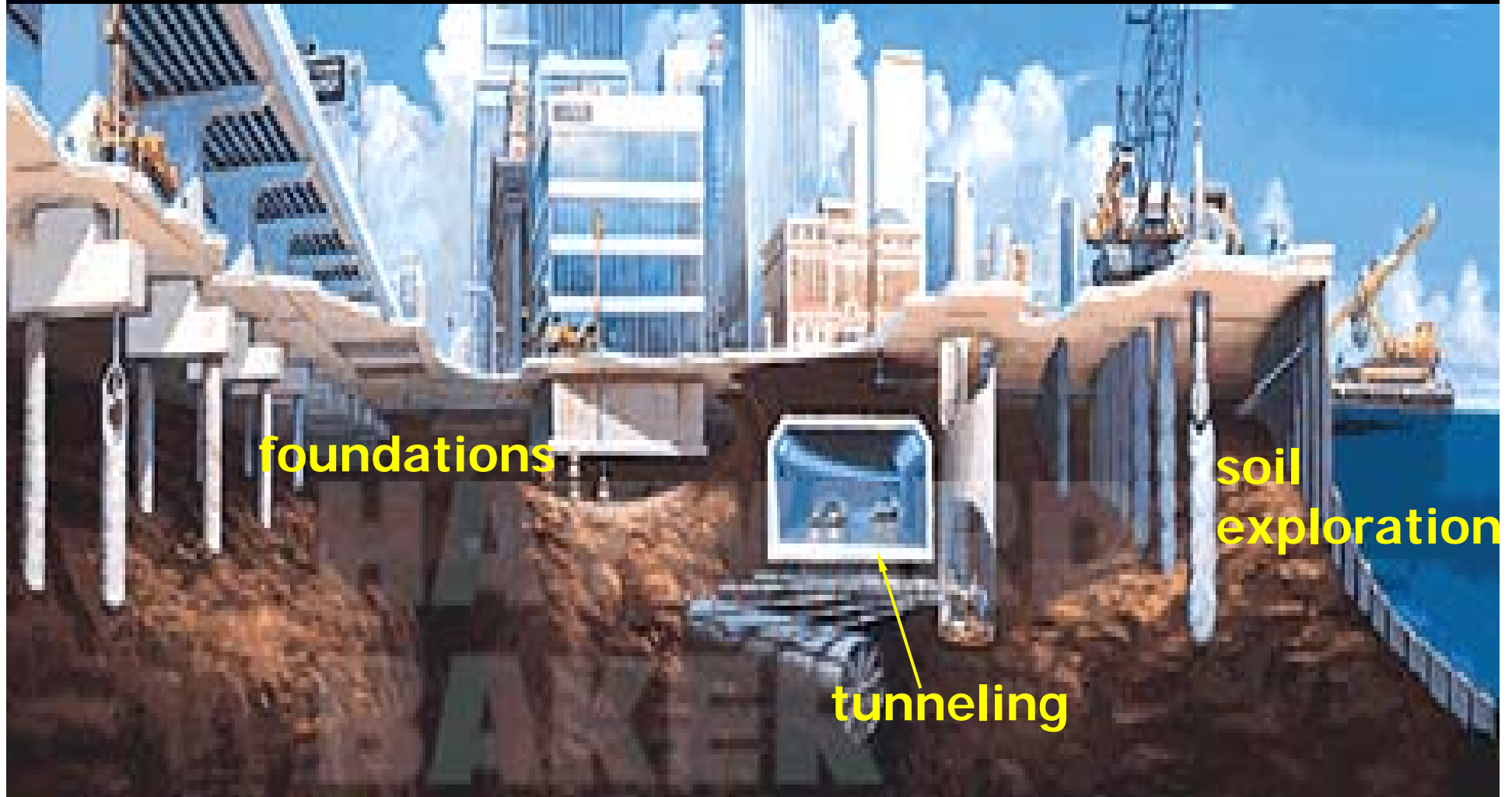
In Townsville, Australia

Sea wall in Brisbane, Australia



To contained dredged spoils

Some Civil Engineering marvels



... buried right under your feet.