International Conference on Geosynthetics

CONFINED AND REINFORCED SAND RETAINING WALLS RESISTED VII GRADE SEISMIC MM INTENSITY

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ANDEX
Líderes en Ingeniería de Geosintéticos

SOIL STABILIZATION OF SOUTH PANAMERICAN HIGHWAY

CERRO DE ARENA SECTOR KM 715 – KM 774 (between Atico and Ocoña)

Shanon&Wilson Corpei 1997

CERRO DE ARENA SECTOR
KM. 731+000 TO KM. 731+248

CERRO DE ARENA SECTOR

KM. 731+000 TO KM. 731+248

SOIL EXPLORATION

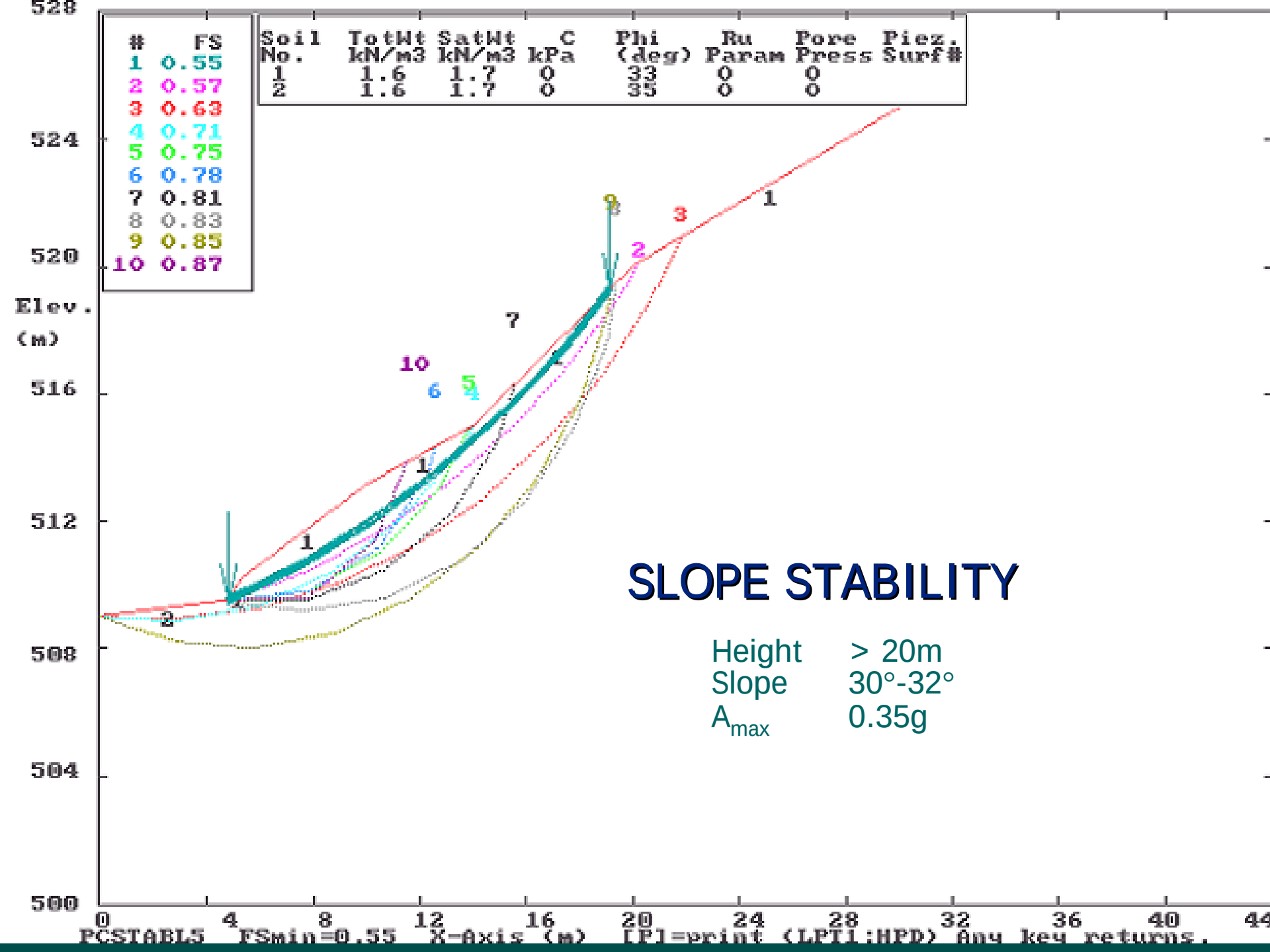
- 05 Lines of seismic refraction - 3415 km.
- 04 Standard penetration tests SPT - 21.80 m.
- 14 Dynamic cone penetration - 55.65m.
- 26 Sowers cone penetration tests - 58.4 m.
- 14 Light dynamic penetration test - 62.70m.
- 15 Undisturbed ring sand samples.

LABORATORY TESTING

- Grain size.
- Direct shear test on undisturbed sand samples.
- Soil water content 0.37% to 3.09%.
- Soil density in undisturbed samples 1.52 a 1.6 gr/cm^3.
- Chemical testing.

PHYSICAL AND MECHANICAL CHARACTERISTICS

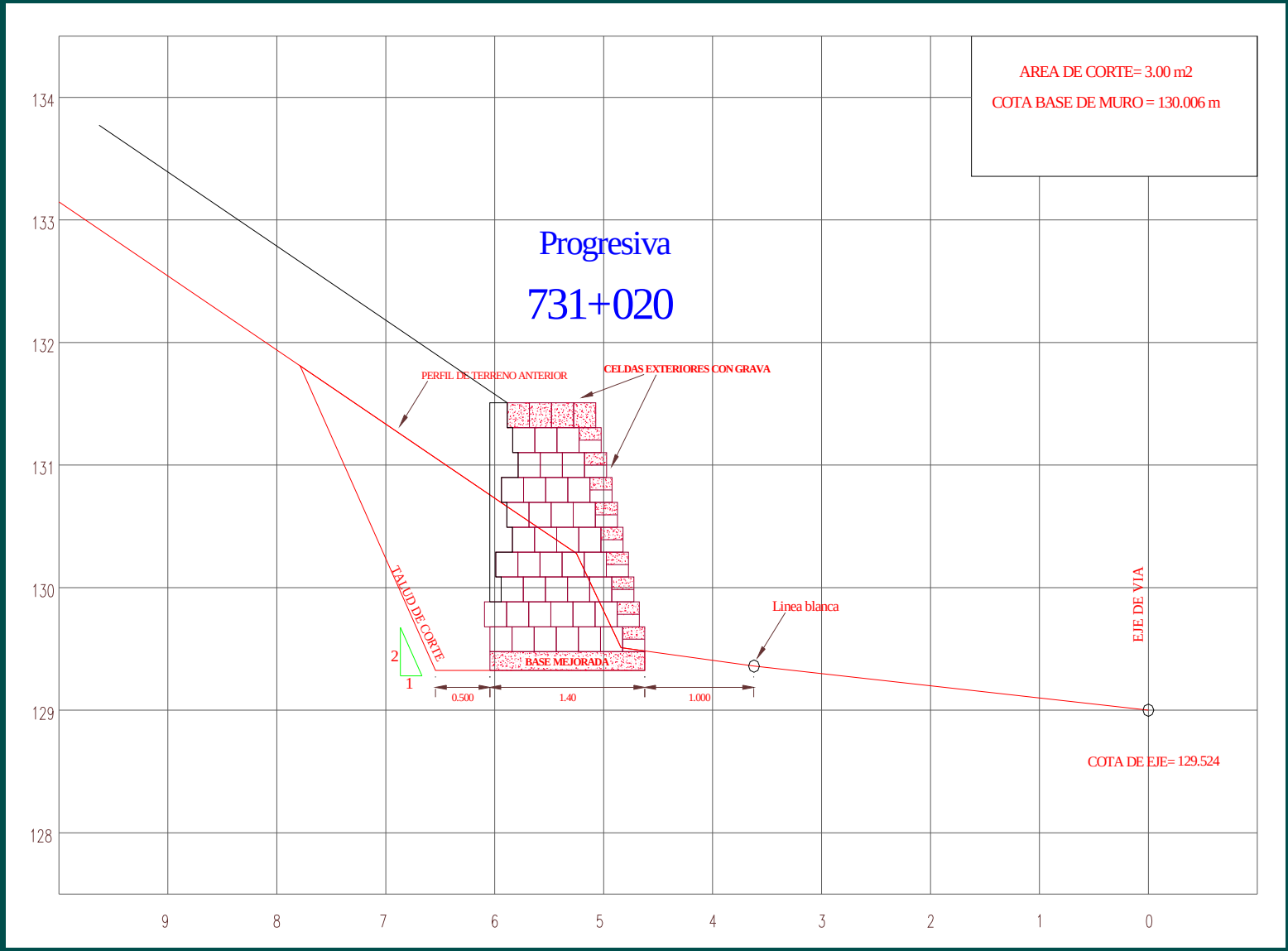
- Soil : cemented sand, fine, clean to silty
- SUCS : SP, SP-SM y SM
- γ_d : 1,55 gr/cm^3
- C´ : 0.1-0.25 kg /cm^2
- Φ´ : 33º



SLOPE STABILITY

Height	> 20m
Slope	30°-32°
A_{max}	0.35g

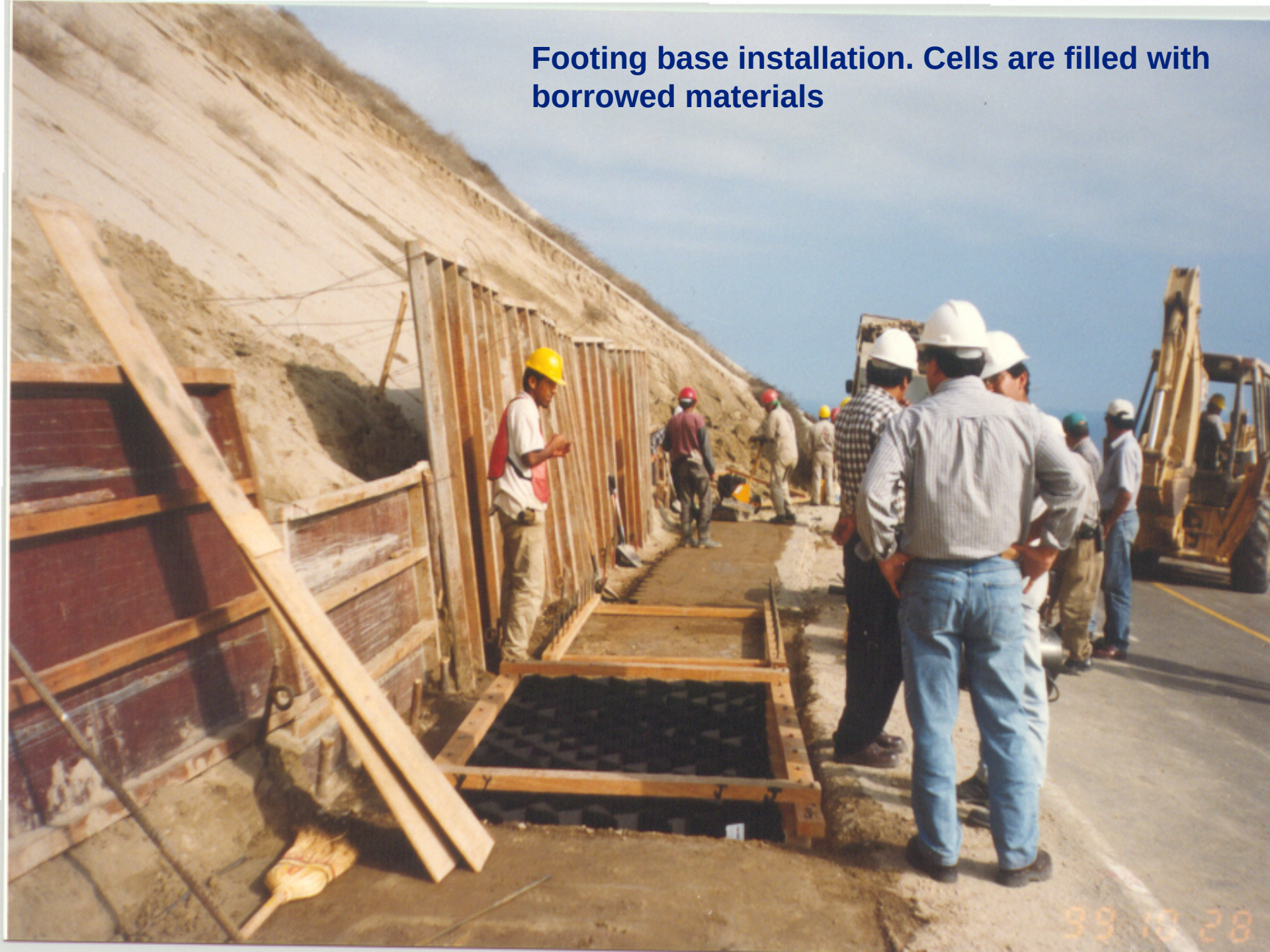
GRAVITY WALL WITH GEOCELLS
HEIGHT=2m



CONSTRUCTION PROCESS
KM. 731+00 TO KM. 731+248

Material cleaning at the slide toe

Panel construction to avoid sliding sand into working area


Footing base installation. Cells are filled with borrowed materials

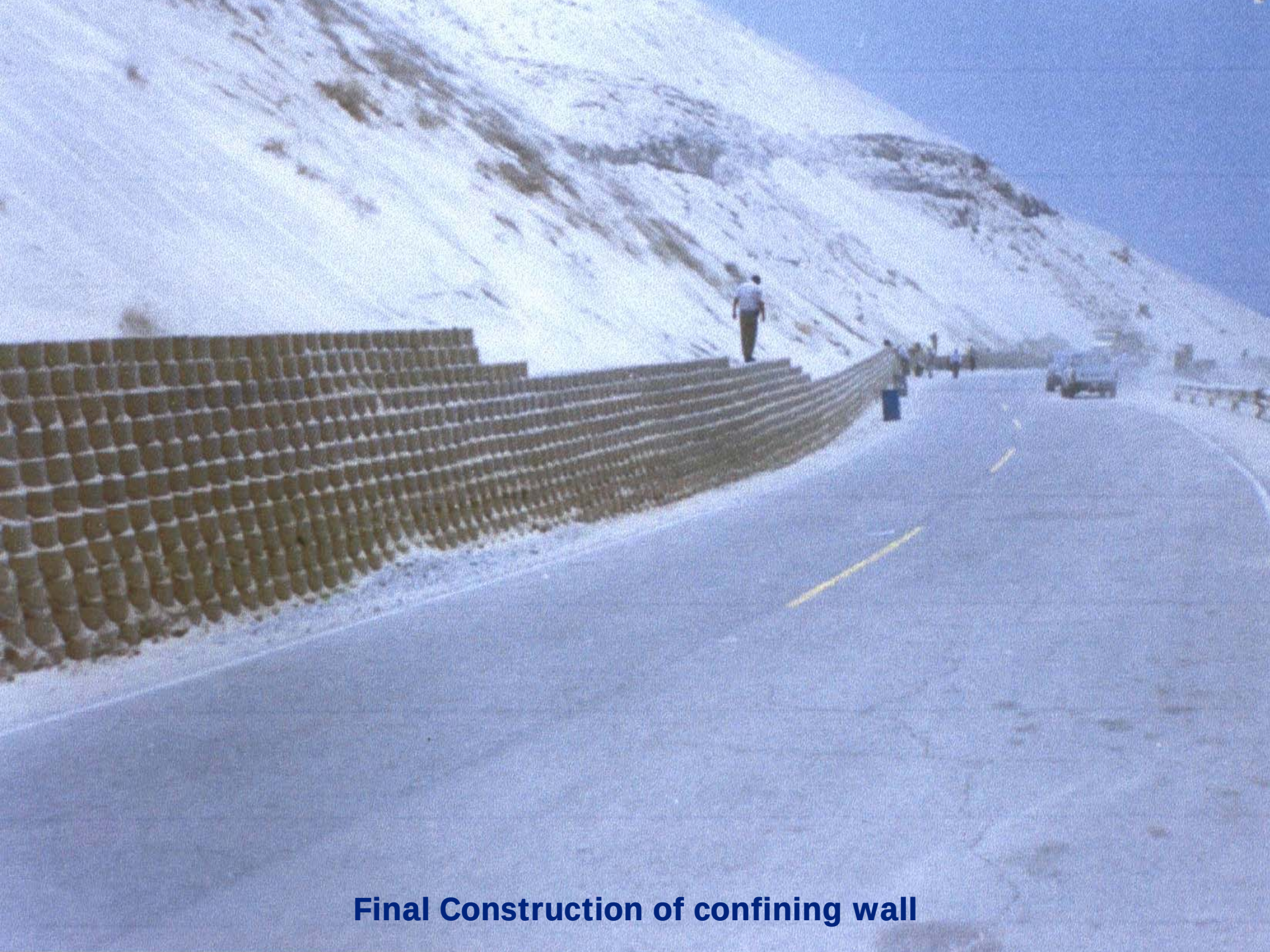
Cells installation

Application of moisture to sand slope to make possible wall construction.

Compaction work of sand fill.

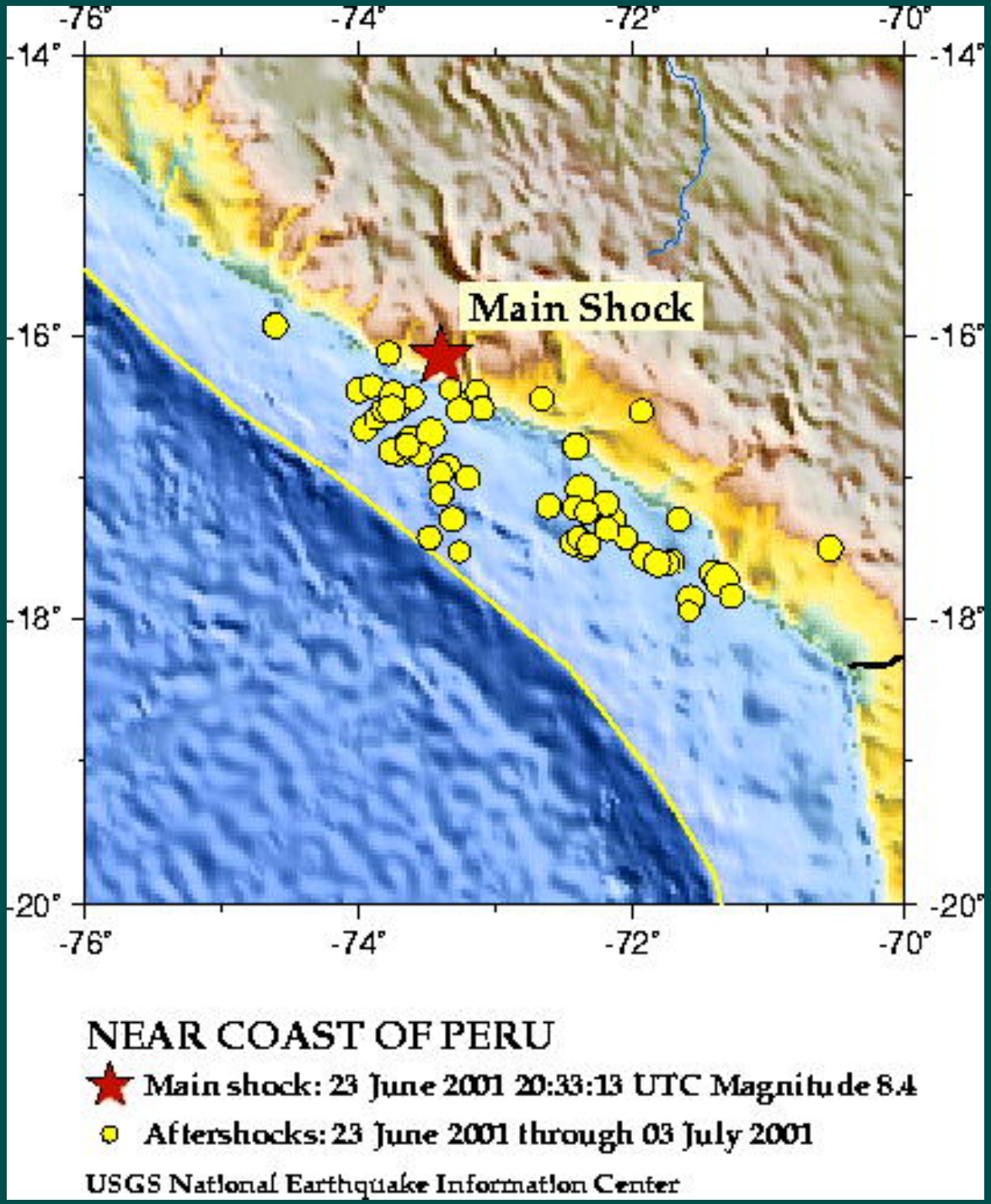
Wall of 250 m located in Km 731+000.

Construction of lower wall.



Final Construction of confining wall

SEISMIC BEHAVIOR OF CONFINED AND REINFORCED SAND RETAINING WALL OCOÑA, AREQUIPA EARTHQUAKE 21.06.01



AFTERSHOCKS

01/16/23 UTC 16.15S
73.40W Depth: 33.0 km 8.4
Mw NEAR COAST OF PERU

110 miles (175 km) SSE of Puquio, Peru

Isoseismal map of Arequipa June 23 2001 Earthquake.

Tavera et al (2002)

Ocoña Earthquake 21.06.01

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SLIDING FAILURES

LONGITUDINAL CRACKS

Ocoña Earthquake 21.06.01

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