

The Great Pyramids and Sphinx

Engineering geological conditions and problem:

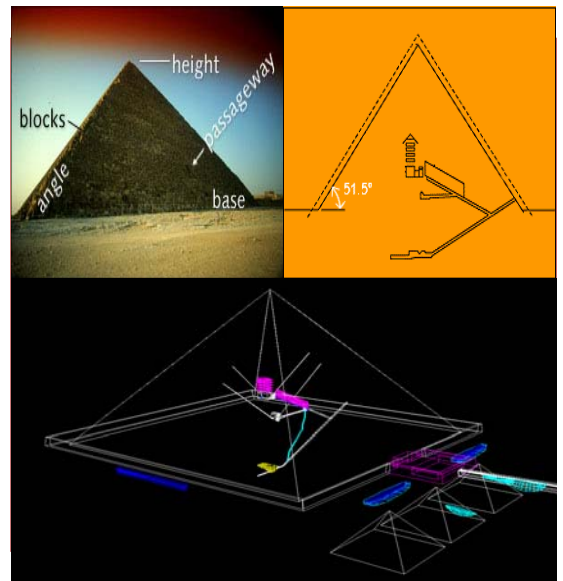
- On the western side of the Nile-which it's valley in this area is built up of a thick sedimentary sequence ranging in age from Middle Eocene to Recent-were built the great pyramids on the Giza limestone plateau "where the sun sets and dies", the topography somewhat subdued and the Eocene succession is thinner and has a 25 m grey to yellowish limestone bed at the base.
- The main geotechnical problems are:
 - differential settlement and subsidence,
 - creep or failure of sloping ground,
 - rise of humidity due to adverse hydraulic effects,
 - seismicity, in addition to the wind abrasion and the relative pore-size distribution in the various beds .
 - the core body or thoracic region of the Sphinx are more durable than the lower beds.
 - the geological faults.



Protection measures already have been taken or have to be taken:

The most important conservation activity was the stone recasting of the Sphinx to protect it from the effect of wind and other weathering factors.

Concerning pyramids repointing of ancient mortars was established but they are till now defending hard against weathering agents.



Other information:

About 2550 B.C., king Khufu, the second pharaoh of the fourth dynasty commissioned the building of his pyramid tomb at Giza, in 146.5 m high using over two million blocks of stone weigh 2.5 tons, and the heaviest blocks used for ceiling Khufu's burial chamber, weigh 40 to 60 tons, The Sphinx was cut of the lime stone of Pyramids plateau $29^{\circ} 59' E, 31^{\circ} 07' N$, taking the body of lion and the face of king Chepren Khufu's son.



References on studies already performed:

- Moussa, A., Study the Effect of Geology on the Deterioration of Rock-cut tombs at Saqqara area-Egypt, master thesis, Cairo University, Egypt, 2001.
- Schoch, R.M., How Old is the Sphinx, Villard Books/Random House, New York, 1992.