

SMITHSONIAN INSTITUTE

NATIONAL MUSEUM OF NATURAL HISTORY
WASHINGTON D.C. - USA

Real time vibration monitoring within the Exhibition Halls

The National Museum of Natural History of the Smithsonian Institute is one of the most visited museums in the world. The exceptional paleontological collection houses some of the most beautiful and well known dinosaur skeletons.

During the refurbishment of the museum, the dinosaurs' exhibition hall was scheduled for some extensive repairs.

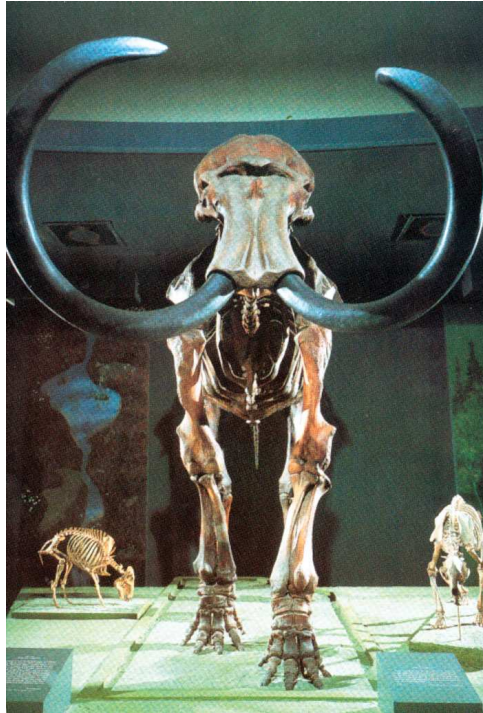
Knowing the fragility, age and rarity of the specimens on display, it was impossible to remove or dismantle them. The work to the hall, which consisted of remaking the floor, had to be carried out taking into account this constraint.

The main problem caused by this work was the effects of vibration to the exhibits, and was mainly caused during the repairs to the floor slab. Around each of the exhibits the existing slab had to be separated from the rest of the floor using power saws, hammer drills and other machines that may induce vibrations within the slab which could affect the exhibits.

SolData's main objective was to effectively monitor the levels of vibration caused in real time and set up a system of automated alarms that could be triggered.

The instrumentation onsite included:

- 2 Gorgone seismographs linked to 4 tri axial geophones.
- A radio connection allowed collection of the Gorgone data by a computer installed in the palaeontologist director's office



Above: Dinosaur Exhibition Hall

Left: Example of monitored exhibit - Mammoth skeleton found in the Alaskan ice, near Fairbanks.

Thresholds had been defined by the palaeontologists and in case of breaching the specified limits, alarms were activated and works suspended.

This instrumentation period has allowed engineers to understand that the air conditioning system of the building, situated under the exhibition hall, was a source of vibration with a frequency and amplitude that was defined as harmful to the prehistoric exhibits.

OWNER :	SMITHSONIAN INSTITUTE
ENGINEERS :	ARCHITECTURAL CONSULTANCY: ARCHITRAVE.
PROJECT DURATION:	2001-2002
SCOPE OF WORKS: <ul style="list-style-type: none">• Installation of a real time monitoring system including:<ul style="list-style-type: none">- 2 GORGONE Seismographs, each linked to 4 triaxial geophones,- real time radio transmission.• Automatic real time monitoring.• Data and Alarm management.	