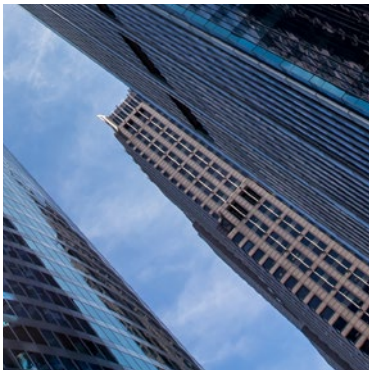
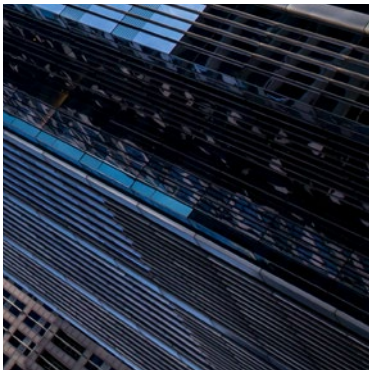
OSMOS | STRUCTURAL HEALTH MONITORING



BUILDINGS IN SENSITIVE ENVIRONMENTS

OSMOS can detect your buildings' structural defects in any situation

Safe Works

osmos

STRUCTURAL HEALTH MONITORING

A subsidiary of EREN Group and an expert in natural resource efficiency, OSMOS aims to extend the lives of structures by optimizing their upkeep, in order to save energy and economize on the materials needed for new builds. With recognized expertise in France and abroad, the company has made a name for itself as a major player on the structural health monitoring (SHM) market. Thanks to its innovative technology and its expertise, OSMOS gives managers of structures and engineering and construction companies the possibility of continuously monitoring changes to their structures, in real time.

Since its creation, OSMOS Group has been working to continuously improve its processes and services, in the interest of customer satisfaction.

ISO 9001 BUREAU VERITAS Certification

OSMOS Group is ISO 9001-2015 certified.

MONITORING AND PRESERVATION OF BUILDING INTEGRITY IN ANY SITUATION

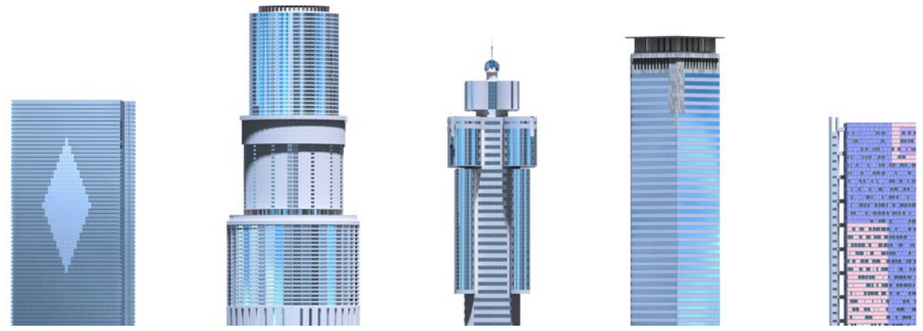
The subjects of building health and structural risk management are becoming a major source of concern for local populations. In addition to being exposed to internal constraints, certain structures may also be strained by events associated with their environment, namely weather and seismic phenomena, as well as neighboring construction projects. Those stresses increase the risk of the appearance of problems in buildings and can compromise their structural integrity. OSMOS solutions respond to these issues, by identifying the risks specific to each construction and assessing how the structure responds to those types of events.

OSMOS, STRUCTURAL DATA SUPPLIER

The external strains to which certain buildings are exposed may cause or exacerbate structural defects. Although those structures are particularly sturdy and are inspected regularly, vicissitudes associated with the local environment remain a threat to their stability and, therefore, to the safety of their users. OSMOS solutions offer responses to the issues specific to structures located in sensitive areas, thanks to the early detection of structural faults. The information derived from our services are of precious help in managing risks and in improving building management and upkeep.
By combining continuous monitoring and behavioral engineering, OSMOS is able to:

- Monitor and analyze a building's overall stability
- Monitor and analyze the impact of weather and/or seismic phenomena
- Continuously monitor structural defects and questions (e.g. fissures)
- Monitor the impact of neighboring structures (construction work, environment, vibrations, etc.).

OUR METRICS FOR CONTROL OVER YOUR STRUCTURAL RISKS



RECEIVE CONTINUOUS BEHAVIORAL DATA FOR YOUR BUILDINGS

Our monitoring systems make it possible to quantify and track the behavior of your structure, without interruption. This gives you accurate information about its state of health and allows you to adapt its operation accordingly, to ensure the safety of all property and people.

COLLECT ONE-OFF EVENT DATA

Thanks to our continuous, real-time monitoring, OSMOS can detect all dynamic events, such as earthquakes and weather phenomena (primarily strong winds), and analyze the consequences of those occasional strains on the structure's behavior.

ANALYZE THE DYNAMIC CHARACTERISTICS SPECIFIC TO THE STRUCTURE

Our systems define each building's dynamic characteristics (frequencies, damping ratio and modal deformations). As a result, when an event occurs, any significant changes in the structure's behavior will be detected.

DETECT DEFECTS AND LOCATE CRITICAL POINTS

Our solutions offer early detection of signs of structural anomalies that could have an irreversible impact on your structure and on your users' safety. This, in turn, allows you to identify and locate your structure's critical areas, so you can take the necessary measures to preserve the building.

RECEIVE NOTIFICATIONS FOR ANY ANOMALIES DETECTED

Our systems run continuously and in real time. This way, you are instantly alerted to any abnormal behavior detected in your building.

ACCESS YOUR BEHAVIORAL DATA VIA OSMOS SAFE BUILDINGS

Your building's data can be accessed 24/7, by means of a dedicated data viewing interface.

ASSESSING THE IMPACT OF EXTERNAL STRESSES (SURROUNDING STRUCTURES, CLIMATE PHENOMENA, EARTHQUAKES, ETC.).

YOUR STRUCTURE'S RESPONSE AT A SPECIFIC TIME

Buildings like high-rises are subject to a multitude of constraints associated with weather and/or seismic conditions, human activity and the surrounding environment. Thanks to continuous, real-time measurements, OSMOS can not only analyze the structure's long-term behavioral trends, but also the impact of occasional "dynamic" stresses. Studying its responses during and after an event can help determine whether or not that strain caused any irreversible damage.

Easy to install, causing no damage or interruptions in service

See the presentations of OSMOS LIRIS and OSMOS EDAS on **osmos-group.com**

Dynamic (instant) analysis

■ MONITORING THE IMPACT OF WEATHER PHENOMENA

Extreme temperatures, heavy rain and strong wind are examples of dynamic constraints that can cause structural faults, particularly in high-rises. OSMOS solutions can measure the impact of these weather phenomena and their actual effects on a building's behavior.

■ MONITORING THE IMPACT OF NEARBY WORK AND NEIGHBORING CONSTRUCTIONS

Changes to the soil bedding, vibrations and load transfers generated by nearby work on the structure or on neighboring buildings can have lasting consequences, extending well beyond the duration of the construction project. That strain can engender significant structural changes that need to be monitored in real time.

MONITORING OVERALL STABILITY AND THE STRUCTURE'S CRITICAL AREAS

RESISTANCE TO REPEATED EARTHQUAKES AND WEATHER PHENOMENA

Although buildings that are exposed to seismic and weather risks are designed to resist those phenomena, they can still have an impact on such structures. Continuous monitoring makes it possible to describe a structure's mechanical behavior and identify its structural weaknesses. In the long run, the quantity of data recorded will also enable forecasts about a building's future mechanical behavior and its estimated remaining life.

Information communicated via reports and the SAFE Works Dashboard

See the presentation of SAFE Works on **osmos-group.com**

Static (cyclical) analysis

■ DETECTING CRITICAL POINTS

OSMOS provides accurate, conclusive information about the severity and cause(s) of any damage and carries out important checks to help managers make the right decisions. By continuously monitoring the structure's critical points, we can assess all immediate and long-term structural risks, as well as the mechanical behavior of the building.

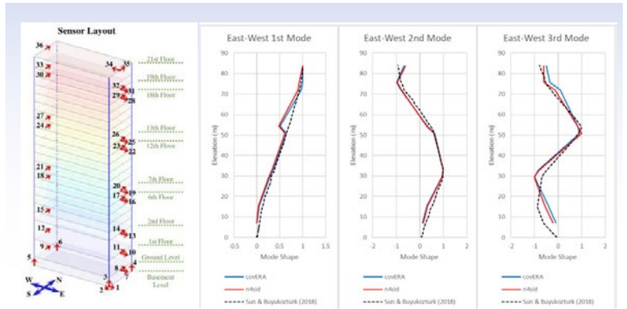
■ MONITORING OVERALL STABILITY IN THE LONG RUN

OSMOS's expertise yields concrete answers about a building's resistance to different stresses. By implementing structural monitoring over a long enough period of time, the resulting metrics can be used to assess the construction's exact state of health, monitor any changes over time and predict its future mechanical behavior.

GLOBAL AND LOCAL DETECTION

DETECTING POTENTIAL DAMAGE AND ESTIMATING DISPLACEMENT

OSMOS records a structure's dynamic characteristics – the frequency, damping ratio and modal deformation of each mode of vibration – in order to define its intrinsic signature. After experiencing stress, that signature indicates whether or not the building has suffered any damage, locates the damage and assesses its severity.

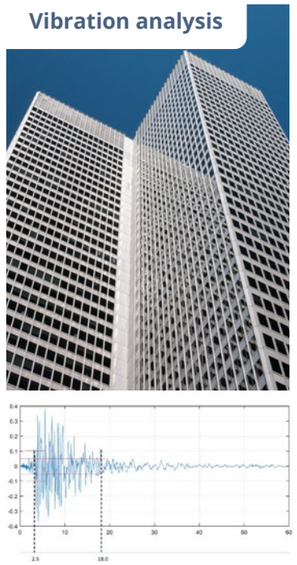


1 Installation of OSMOS AAA accelerometers

2 Examination of modes of vibration

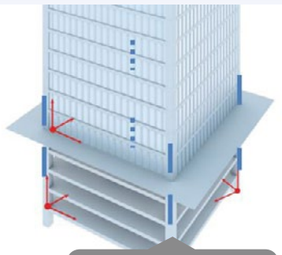
3 Measurement of the elasticity of dynamic responses

Vibration analysis



MONITORING STRUCTURAL DEFORMATIONS WITH OSMOS OPTICAL STRANDS

Deformation analysis



Measurement of deformations using OSMOS Optical Strands

Acceleration data from AAA accelerometers and deformation measurements from OSMOS Optical Strands, all covering the entire building, can be combined, in order to produce precise information about a structure's overall stability and to preserve its structural integrity in the long term.

SIX REASONS TO CHOOSE OSMOS

OSMOS
helps with your decisions, so you can:

1 PRESERVE YOUR PROPERTY'S INTEGRITY AND VALUE

Protect your structure from the vicissitudes to which it is exposed. By placing it under continuous monitoring and carrying out targeted maintenance actions, you can guarantee its integrity and its preservation over time.

2 KEEP YOUR BUILDINGS IN WORKING ORDER

Ensure your buildings' availability, thanks to preventive management, by taking action in the right place, at the right time, so you can prevent urgent situations.

3 CONTROL PERSONAL AND PROPERTY SAFETY

Our monitoring systems function in real time and detect any abnormal behavior, 24/7, for optimal control over your structure's safety.

4 AVOID THE COST OF DOWNTIME

Put an end to urgent responses: avoid critical situations that could force the closure of your building and the substantial expenses associated with protective measures.

5 EXTEND THE LIVES OF YOUR BUILDINGS

Verify the actual impact of natural and environmental phenomena on your property, in order to define appropriate upkeep actions to preserve your structure and extend its life.

6 SCHEDULE MAINTENANCE AND REPAIRS

Tailor your maintenance policy to your structure and manage your priorities, so as to significantly reduce the costs of your bridge's upkeep and renovation work.

OUR SIGNATURE PROJECTS

Tour Europe and Tour Blanche, La Défense, Puteaux, France
10 years tracking internal constraints
Preventive monitoring of the tower block during neighboring construction projects

Fondation Louis Vuitton, Paris, France
Monitoring of towers before and after the installation of overlapping megastructures

European Patent Office, Rijswijk, Netherlands
Monitoring of various EPO buildings in Rijswijk during demolition and construction work

Mont Parnes Casino, Athens, Greece
Monitoring of the behavior of a structure located in a seismic zone during a redevelopment project

Agia Sophia Stadium, Athens, Greece
Structural Health Monitoring of prestressed pylons during construction phases of New AEK Stadium « Agia Sophia »

Notre-Dame Cathedral, Paris, France
Assistance with the stabilization of the Notre-Dame site, through continuous, real-time monitoring of the building's critical areas

La Samaritaine, Paris, France
Load testing and monitoring of the structure's behavior during construction

Résidence Gaston Pinot, Paris, France
Verifications after swaying was noted in one of the buildings, describing the ground-related issues and identifying at-risk zones

OUR SATISFIED CUSTOMERS

La Défense

Petit Construction

TBI Construction

Aktor Construction

Dikefalos 1924 SA
Ermonassa SA
Dimand SA

Etablissement Public Notre-Dame de Paris
DRAC Ile-de-France

Vinci Construction

Paris Habitat

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STRUCTURAL HEALTH MONITORING

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