EMS
Brüel & Kjær

MAINTAIN PATIENT AND NEIGHBOR COMFORT DURING HOSPITAL CONSTRUCTION

PHOENIX
noise & vibration

Suburban Hospital planned an expansion that would affect its operations and nearby neighbors. Phoenix Noise & Vibration was contracted to manage the project's environmental impact in order to uphold hospital operations, ensure compliance with regulations and reduce community annoyance.

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CHALLENGE

Manage noise and vibration during the construction and expansion of a busy hospital to abate patient and neighbor disturbance.

SOLUTION

Sentinel, a web-based subscription service, continuously monitored the environment inside and outside the hospital to assess impact and address complaints.

RESULTS

The healthcare facility provided positive patient experiences and enhanced community relations throughout the project.

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Scott Harvey
President of Phoenix Noise & Vibration, LLC.

BACKGROUND

Suburban Hospital is a not-for-profit healthcare facility and trauma center serving Montgomery County, Maryland, in the United States.

The facility operates under a special exception waiver in a residential zone. Historically, neighbors have been sensitive to the noise from its operations and resistant to hospital expansion.

As the healthcare industry continues to grow, the ability to expand and modernize existing facilities is imperative. Maintaining patient comfort and hospital operations while minimizing the impact on residential communities is a critical component of expansion plans.

THE CHALLENGE

Suburban Hospital wanted to demolish existing structures and construct new buildings while maintaining operations and good community relations. It sought to continuously monitor sound and vibration near the site and inside the hospital to know the impact caused by these activities, identify exceedances, deliver reports and meet community needs.

Assessing impact

The hospital wanted to record all outdoor noise and vibration to know how the project was affecting those around it. Monitoring inside the hospital was also a key requirement to mitigate disturbances that could interfere with sensitive equipment.

Identifying exceedances

Suburban Hospital's monitoring system needed to be able to send alerts before specified parameters were breached. Notifications sent in real-time would enable quick action that could mitigate potential exceedances.

Delivering reports

Automatically generated weekly reports were provided to the hospital to track the threshold levels that were determined by the Montgomery County Noise Ordinance. Daily data was necessary to fully address community inquiries about noise or vibration concerns.

Meeting community needs

Because the facility is near residential neighborhoods, it needed a monitoring solution capable of providing credible data to the community. Trusted information would help to build support for successful growth of operations.

"We needed to confidently collect data. We had to be able to pull up data from any time in the past and develop reports on very short notice," said Scott Harvey, president of Phoenix Noise & Vibration, LLC.

THE SOLUTION

Whiting-Turner, the construction project's general contractor, hired acoustical engineering firm Phoenix Noise & Vibration to establish an air-borne noise and ground-borne vibration monitoring program for Suburban Hospital.

Phoenix Noise & Vibration selected Sentinel as its environmental monitoring system. Sentinel is a web-based solution that provides real-time unattended noise, vibration, dust and air quality monitoring 24 hours a day, 7 days a week.

"We'd been watching the landscape for long-term noise monitoring solutions," said Harvey. "We were interested in bidding on these types of projects, but weren't convinced that an adequate rental solution existed until we found Sentinel."

The easy-to-use managed system provided the consultant with everything it needed to monitor: instrumentation, installation, operation, data capture, records management, calibration and fault rectification.

All instrumentation was placed outside except for one location inside the hospital. The indoor equipment was located on the 4th floor near patient rooms and vibration-sensitive operating theatres. To keep instruments out of the way, the unit was mounted to the underside of a structural slab.

Results

Sentinel accurately and efficiently monitored noise and vibration for Suburban Hospital. Its data was used to:

- Understand how construction activities affected patients and neighbors
- Provide peace of mind when providing healthcare services in noise and vibration sensitive areas
- Prove compliance with local ordinances
- Enhance community relations by quickly addressing complaints using fact-based data
- Reduce engineers' workloads
- Monitor noise and vibration

Sentinel provided a turn-key noise and vibration monitoring solution with easy-to-use software and technical support. Its reliable data ensured the acoustic consulting firm could accurately assess how site activities were affecting people nearby.

"Stability and durability of instrumentation was a key concern of ours. Sentinel's constant uptime and continuous data meant the information we needed was always available for analysis," said Harvey.

Additionally, the system's historical audio playback feature enabled noise source identification to know with certainty if hospital construction caused a particular event.

Maintaining patient comfort

Because the innovative system continuously monitored noise and vibration impact, the hospital maintained high-quality patient care throughout the project. Sentinel's alerting capability provided confidence that noise and vibration limits weren't being breached. By ensuring site activities didn't interfere with delicate hospital equipment, notifications requiring emergency response weren't needed.

"It's been very helpful to have real-time data available when community members ask questions about either noise or vibrations emanating from the construction site. It reassures the community to learn that the hospital is paying attention to this and trying to minimize impacts to the surrounding neighborhood."
Hospital Administration

Demonstrating regulatory compliance

Sentinel automatically delivered reports to efficiently show how noise and vibration rated relative to local and national standards. Demonstrating compliance with environmental ordinances helped to prevent costly delays.
"The hopital received inquiries from neighbors regarding ground-borne vibration and potential

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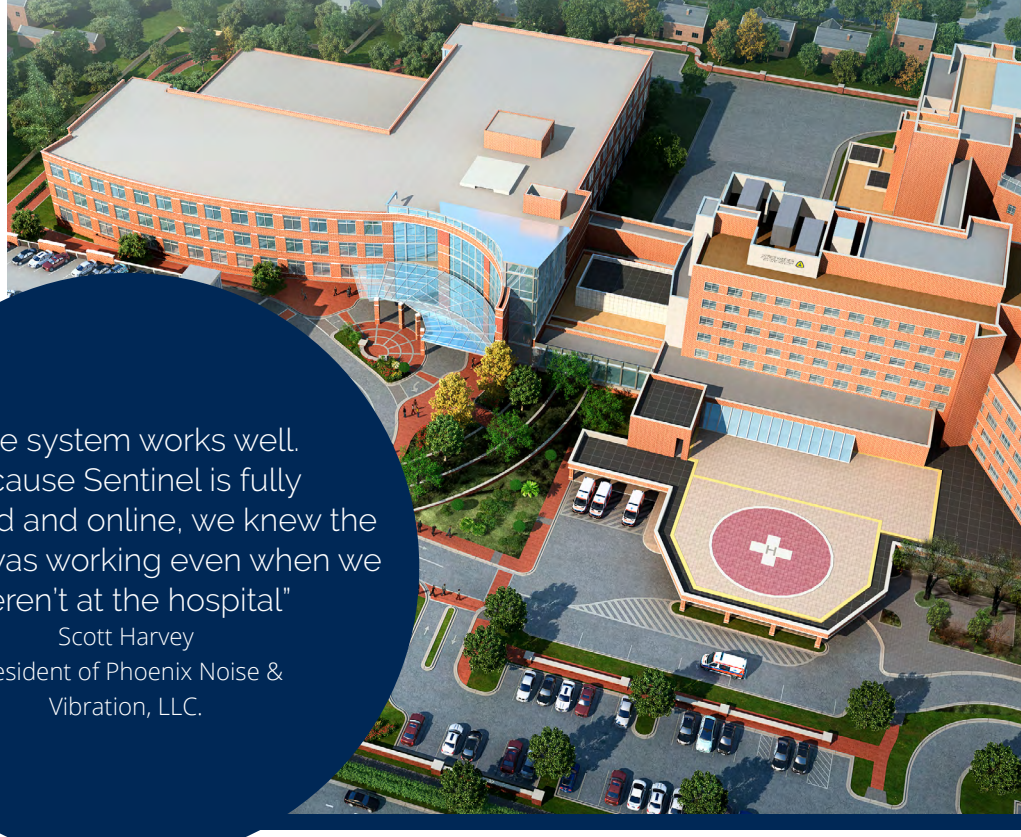

structural damage to houses," said Harvey. "Sentinel served as a 'fire extinguisher' for Whiting-Turner, Clark Construction and hospital administration to provide quick and accurate answers, assuring neighbors that vibration levels were in compliance and well below the threshold of structural damage."

> "The system works well. Because Sentinel is fully managed and online, we knew the system was working even when we weren't at the hospital"
> Scott Harvey
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Enhancing community relations

Sentinel's data enabled Phoenix Noise & Vibration to effectively handle complaints. Pertinent data was immediately reviewed by the acoustic consultant for informed discussions about what actually occurred.

The system's continuous monitoring acted as a concrete record of performance, which provided the foundation for credible and transparent communications.

Timely retrieval of noise and vibration data was crucial when neighbors raised concerns about the impact of vibration on their buildings and how construction noise affected their daily lives.

Reducing workloads

Sentinel's independent operations minimized the engineering team's workload throughout the project since people weren't required on site to operate and maintain the monitoring terminals.

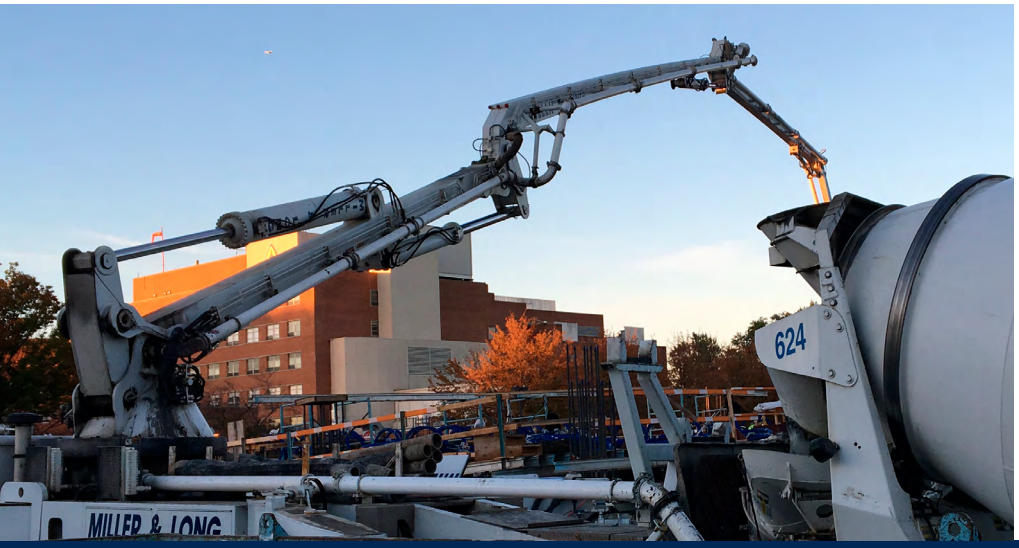
"The system works well. Because Sentinel is fully managed and online, we knew the system was working even when we weren't at the hospital," said Harvey. "Productivity was also up because at any time we could just access the data we needed to deal with complaints."

CONCLUSION

Sentinel provided Whiting-Turner and Suburban Hospital with the confidence, capabilities and expertise needed for long-term noise and vibration monitoring.

The cost-effective system reduced the need for human and financial resources. Because Sentinel operates independently, Phoenix Noise & Vibration was free to focus on data analysis and communication rather than equipment operation.

"EMS Bruel & Kjaer responded quickly in addressing and fixing problems, whether they were hardware or software related. Sentinel's continuous monitoring is reliable. It's a valuable tool for acoustical consultants and worthwhile for prime contractors and building owners," said Harvey.



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