

USER STORY

Industry: Construction
Aisei Ltd.

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From “Scrap-and-Build” to “Maintain-and-Preserve”



FARO's 3D Laser Scanning Technology Used to Detect Instability in Urban Structures

With the Focus^{3D}, Aisei can now perform scans and take measurements at high altitudes, or in areas with high volumes of traffic. As a result, there is better personal safety for the team conducting the study. The device also greatly improves the company's efficiency as the same task can now be completed in a much shorter time, requiring fewer employees. Team members can be deployed to carry out other tasks instead.

Moreover, as a tool, the Focus^{3D} also offers much more information and value than the conventional tape measure used to. For this reason, Aisei has been receiving more business enquiries since the company is now able to provide more in its analyses.

Introduction

1964 marks the year the last Summer Olympics was held in Tokyo, when Japan was enjoying an economic boom. Much of the country's urban infrastructure was built around that time, including the famous Shinkansen "bullet train" rail system. For a nation that subscribes to a scrap-and-build mentality, five decades would have seen most structures demolished and rebuilt.

However, change is happening and a paradigm shift is imminent — instead of getting rid of old structures or repairing it only after it breaks, the new mentality is to maintain and preserve. Urban structures are now monitored, so that they are reinforced or repaired before a breakdown occurs, which lengthens its lifespan.

One such company actively involved in the preservation of Tokyo's urban landscape is Aisei Ltd, a professional structural inspection company. Nestled in a corner of Sugamo in Toshima Ward, Aisei inspects, investigates, and diagnoses urban structures, with a focus on bridges and tunnels. The company's work involves checking structures for possible deterioration caused by passage of time, environment or external forces. While it may not appear impressive at first glance, Aisei plays a vital role in detecting potential dangers in important urban structures used by thousands of commuters daily.

Technology: A Boost to Safety & Quality



Using the FARO Laser Scanner Focus^{3D} to scan a pedestrian bridge

In the course of their work, the team at Aisei has had to assess many bridges without an original design blueprint in hand. These documents are important especially for earthquake-resistance construction work, because crucial information such as precise dimensions and measurements of the structure are required. To overcome that, Aisei would physically take measurements of the structure using instruments such as tape measures, and manually transfer the information onto 2D blueprints. However, the task of manual measurements is risky to accomplish, and there are often inaccessible areas as well. This has posed a problem for the inspection work.

Consequently, the company decided to invest in a FARO Laser Scanner Focus^{3D} to perform measurement tasks using 3D Documentation technology. Having seen the FARO device at the 2009 Maintenance Techno Show, Aisei understands the Laser Scanner's ability to capture point cloud information at high speeds.

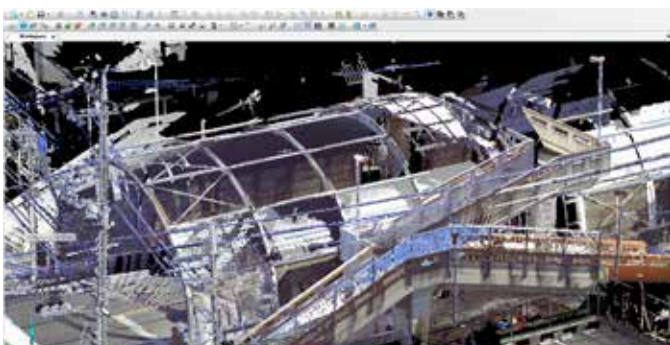
With 3D laser scanning, structural dimensions can be captured easily, replacing conventional hand tools. In addition, information about any structure can be presented in 3D format. When asked about the rationale of switching to the 3D Laser Scanner, Mr. Koichi Iwasa, President of Aisei, said, "Regardless of the industry sector, we believe that the use of 3D source data will become a standard in the future. That is why we decided to introduce the Focus^{3D} into our workflow. We also felt that it would enhance safety and quality management, adding value to the work we are doing."

Application Methods

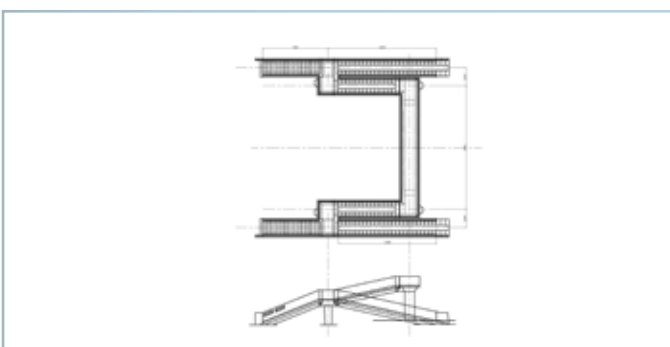
At Aisei, the Focus^{3D} is especially useful for restoration projects for structures that do not come with original blueprints; or projects that involve measurement of depositions and changes in shapes of urban structures; as well as interference simulation projects.

For instance, the team had to “earthquake-proof” a pedestrian bridge that it did not have a blueprint for. The structure was complex and elaborate in nature, and it would have been difficult and dangerous to take manual measurements. With the Focus^{3D}, the team at Aisei managed to capture data from a distance, transfer the data onto a computer, and drew up a design blueprint easily — the drawing is then used for maintenance and project management.

Aisei also used the Focus^{3D} to measure the volume of deposition by the side of railroads. This data indicates to the team exactly how much reinforcement is required to maintain the tunnel's structural stability, which is a major concern for a high traffic passageway. Cross-sectional scans of a tunnel can reveal changes to the terrain. Studying accurate scans of tunnels can then prevent risks in loss of lives should there be any structural instability detected.



3D data of combined scan of pedestrian bridge



Restored 2D drawing derived from scans

Current Tangible Benefits & Beyond

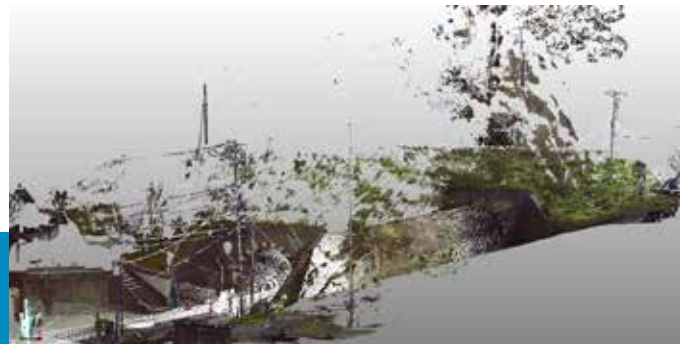
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FARO Laser Scanner Focus^{3D} used to scan a tunnel



Point group data of a tunnel, including data of surrounding terrain



Looking into the future, Aisei also questions how it can better harness the powerful features offered by the Focus^{3D}. Traditionally, jobs in the construction industry have been labeled dirty, demanding and dangerous. The younger generation shuns the idea and avoids such jobs, making it difficult for companies to hire new blood. With the introduction of 3D data processing and computer-related tasks, it is hoped that perceptions amongst the young may change, and their interests piqued, so that the construction industry may be revitalized.

Mr. Iwasa summarized the situation, saying, "In the future, 3D Modeling and Construction Information Modeling (CIM) are expected to make further advancements. Till now, many people have had the impression that scanners are costly. In actual fact, they are much less cost-prohibitive now. I believe that laser scanners will become an industry standard in the coming years. There is also an increasing need for conservation work, in tandem with the growing awareness of such work among various sectors. So I hope that the field of conservation and maintenance will become an established service within the construction industry."

About Aisei Ltd

Aisei is engaged in the business of inspecting, investigating, and diagnosing structures, with a focus on bridges and tunnels. It takes pride in extending the lifespan of good, old structures through the latest technologies without reconstructing anything new. As a professional structural inspection company, Aisei aims to meet the growing needs of societies moving forward into the future.

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About FARO

FARO is the world's most trusted source for 3D measurement, imaging and realization technology. The Company develops and markets computer-aided measurement and imaging devices and software. Technology from FARO permits high-precision 3D measurement, imaging and comparison of parts and complex structures within production and quality assurance processes. The devices are used for inspecting components and assemblies, rapid prototyping, documenting large volume spaces or structures in 3D, surveying and construction, as well as for investigation and reconstruction of accident sites or crime scenes.

FARO's global headquarters are located in Lake Mary, Florida. The Company also has a new technology center and manufacturing facility consisting of approximately 90,400 square feet located in Exton, Pennsylvania containing research and development, manufacturing and service operations of its FARO Laser Tracker™ and FARO Cobalt Array Imager product lines. The Company's European regional headquarters is located in Stuttgart, Germany and its Asia Pacific regional headquarters is located in Singapore. FARO has other offices in the United States, Canada, Mexico, Brazil, Germany, the United Kingdom, France, Spain, Italy, Poland, Turkey, the Netherlands, Switzerland, India, China, Malaysia, Vietnam, Thailand, South Korea, and Japan.

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