3D Laser Scanning for As-Built Facility Management Training Course



14 - 18 Dec 2026

Cape town

4600 € (Per Person)

Ref: #CAD8069_271200

Course Introduction / Overview:

This comprehensive training course provides a deep dive into the transformative technologies of 3D laser scanning and its application in creating precise as-built documentation for effective facility management. In an era where digital accuracy is paramount, mastering these tools is no longer a luxury but a necessity for optimizing building operations, maintenance, and lifecycle management. This program is designed to bridge the gap between the complex technology of reality capture and its practical, day-to-day application in managing physical assets. As highlighted by academics like Dr. Burcu Akinci, a leading researcher in the field of creating digital twins of existing facilities, the integration of rich, as-built data is critical for informed decision-making. Participants will explore concepts discussed in works such as "Point Cloud Data Processing," learning to move from raw scan data to actionable intelligence. BIG BEN Training Center has structured this course to empower professionals with the skills to enhance operational efficiency, reduce project risks, and support the creation of sophisticated digital twins, ensuring facilities are managed with unparalleled precision and foresight.

Target Audience / This training course is suitable for:

- Facility Managers.
- Building Operations Managers.
- Project Managers and Engineers.
- Architects and Design Professionals.
- BIM and VDC Managers.
- Construction Managers.
- Land Surveyors and Geomatics Professionals.
- Maintenance Supervisors.
- Asset Managers.
- Capital Planners.

Target Sectors and Industries:

- Commercial Real Estate and Property Management.
- Construction and Engineering.
- Oil and Gas and Industrial Plants.
- Healthcare and Hospital Management.
- Government and Public Sector Infrastructure.
- Manufacturing and Production Facilities.
- Education and University Campuses.
- Aerospace and Automotive.
- Heritage and Historic Preservation.

Target Organizations Departments:

- Facility Management and Operations.
- Engineering and Maintenance.
- Capital Projects and Construction.
- Design and Architecture.
- Asset Management.
- Planning and Development.
- Health, Safety, and Environment (HSE).
- Information Technology (IT) and Digital Transformation.

Course Offerings:

By the end of this course, the participants will have able to:

- Master the fundamental principles of 3D laser scanning technology and its applications.
- Plan and execute comprehensive 3D scanning projects for various facility types.
- Process raw point cloud data, including registration, cleaning, and filtering.
- Create accurate 2D and 3D as-built models from processed scan data.
- Integrate as-built documentation with existing BIM and CAFM systems.
- Leverage as-built data for space management and optimization.
- Apply reality capture for clash detection in renovation and retrofit projects.
- Develop a strategic framework for implementing digital twin concepts in facility management.
- Enhance maintenance planning and asset lifecycle management using precise digital records.
- Evaluate different scanning hardware and software for specific project needs.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be immersive, practical, and highly interactive, ensuring participants gain both theoretical knowledge and hands-on confidence. This course moves beyond traditional lectures by incorporating a blended learning approach. Mornings will focus on foundational concepts, industry best practices, and the theoretical underpinnings of 3D laser scanning and as-built documentation. Afternoons are dedicated to practical application, featuring detailed case study analyses of real-world facility management projects, from industrial plants to commercial buildings. Participants will engage in collaborative group workshops to solve complex scanning and data integration challenges, fostering teamwork and critical thinking. Interactive sessions will include demonstrations of point cloud processing workflows and modeling techniques. Our expert instructors facilitate an environment of open discussion, encouraging participants to share their unique challenges and experiences. Continuous feedback is provided throughout the course to ensure a deep and lasting understanding of the material, empowering attendees to apply their new skills immediately upon returning to their workplace.

Course Agenda (Course Units):

Unit One: Fundamentals of 3D Laser Scanning and As-Built Data

- Introduction to Reality Capture for Facility Management.
- Principles of LiDAR and Terrestrial Laser Scanning (TLS).
- Types of 3D Scanners and Their Specifications.
- Understanding Point Clouds, Resolution, and Accuracy.
- The Critical Role of As-Built Documentation in the Facility Lifecycle.
- Comparing Traditional Surveying with 3D Laser Scanning.
- Key Terminology and Industry Standards.

Unit Two: Planning and Executing a 3D Scanning Project

- Defining Project Scope and Objectives for Facility Scanning.
- Site Assessment and Pre-Scan Planning.
- Best Practices for Target Placement and Scan Control.
- On-Site Data Acquisition Techniques and Field Operations.
- Managing Environmental Factors and Site Challenges.
- Health and Safety Protocols for Laser Scanning.
- Documenting Field Notes and Creating a Scan Log.

Unit Three: Point Cloud Data Processing and Registration

- Introduction to Point Cloud Processing Software.
- Importing and Managing Raw Scan Data.
- The Process of Scan-to-Scan and Target-Based Registration.
- Techniques for Cleaning, Filtering, and Segmenting Point Cloud Data.
- Georeferencing and Aligning Data to Project Coordinate Systems.
- Quality Assurance and Control for Registered Point Clouds.
- Strategies for Handling and Storing Large Data Sets.

Unit Four: Creating As-Built Models and Documentation

- From Point Cloud to 2D Drawings and 3D Models.
- Scan-to-CAD and Scan-to-BIM Workflows.
- Modeling Structural, Architectural, and MEP Elements.
- Techniques for Feature Extraction and Object Recognition.
- Ensuring Model Accuracy and Level of Detail (LOD).
- Generating As-Built Deliverables like Floor Plans, Elevations, and Sections.
- Quality Control and Verification of As-Built Models against Point Clouds.

Unit Five: Advanced Applications in Facility Management

- Integrating As-Built Data with CAFM and IWMS Systems.
- Leveraging As-Built Models for Space Management and Optimization.
- Clash Detection for Retrofit and Renovation Projects.
- Developing a Foundational Digital Twin for a Facility.
- Application in Maintenance Planning and Asset Management.
- Using Scan Data for Deformation Monitoring and Structural Analysis.
- Future Trends in Reality Capture and AI in Facility Management.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

As digital twin technology becomes more integrated with AI, how might predictive analytics transform traditional facility maintenance from a reactive to a fully proactive and autonomous model?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by focusing intently on the strategic integration of 3D laser scanning within the specific context of facility management, rather than treating it as a purely technical surveying skill. While other programs may concentrate heavily on the operation of hardware and software, our curriculum emphasizes the "why" behind the "how." We delve into the end-to-end workflow, from initial project planning to the final application of as-built data in solving real-world operational challenges like maintenance planning, space optimization, and risk mitigation in retrofit projects. The academic underpinning of the course ensures participants understand the theoretical principles, enabling them to adapt to future technological advancements. We prioritize a holistic, problem-solving approach, teaching participants how to translate dense point cloud data into actionable business intelligence that drives efficiency and reduces costs across the facility lifecycle. The content is designed to empower managers and engineers to build a compelling business case for adopting reality capture technology within their organizations, focusing on strategic value over mere technical proficiency.