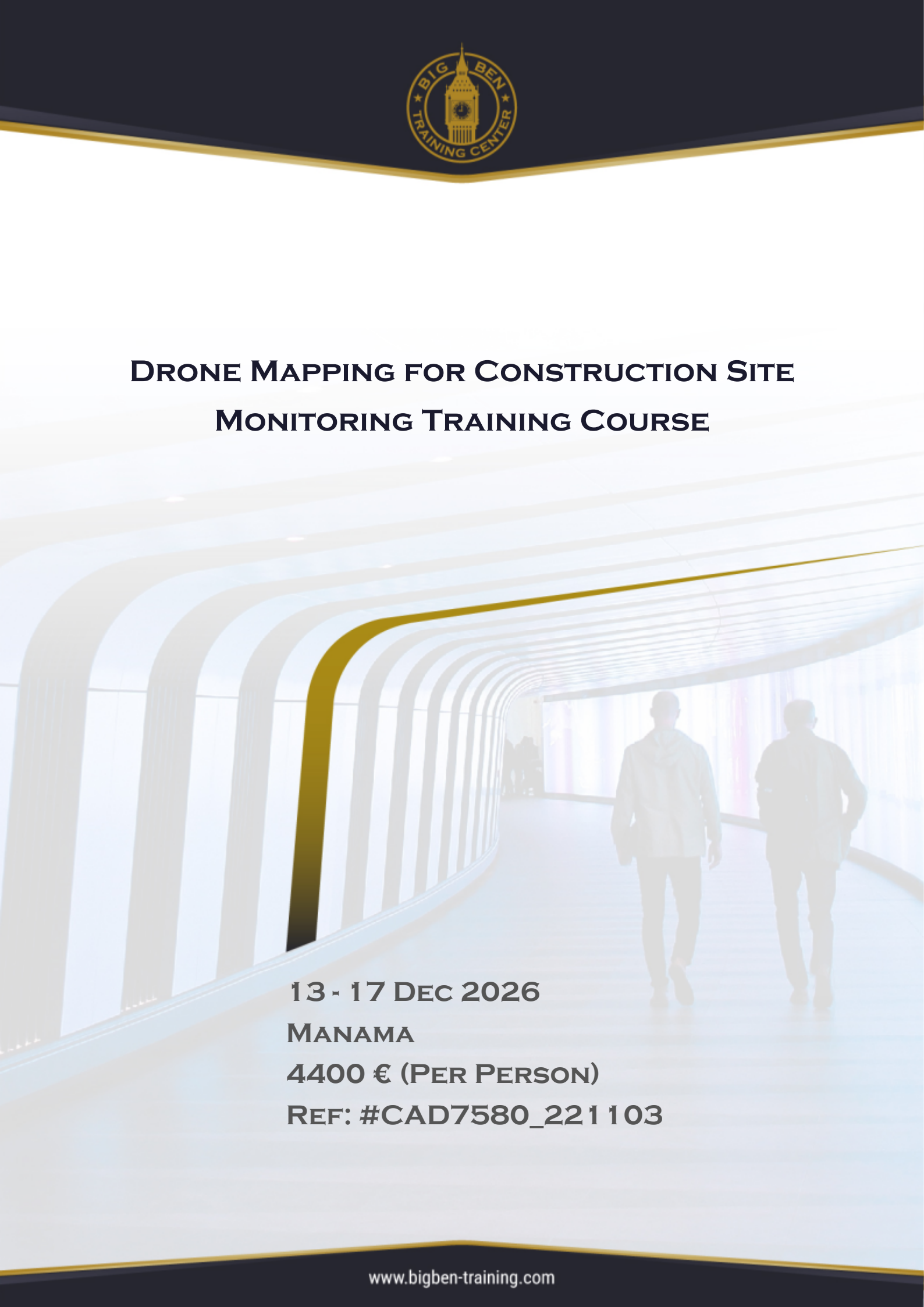
Drone Mapping for Construction Site Monitoring Training Course



13 - 17 Dec 2026

Manama

4400 € (Per Person)

Ref: #CAD7580_221103

Course Introduction / Overview:

This course provides a comprehensive exploration of Unmanned Aerial Vehicle (UAV) technology for modern construction project management. It moves beyond basic flight operations to cover the entire aerial data workflow, from mission planning and data acquisition to advanced processing and analysis. Participants will learn how to leverage drone-based photogrammetry and LiDAR to generate high-accuracy 3D models, orthomosaics, and point clouds, transforming raw data into actionable business intelligence. The curriculum is designed to address the specific challenges of the construction industry, including progress monitoring, stockpile volume calculations, as-built verification, and safety compliance. As discussed by leading academics like Dr. Edward M. Mikhail in works such as "Introduction to Modern Photogrammetry," the precision of aerial data is revolutionizing traditional surveying and inspection methods. BIG BEN Training Center has developed this program to equip professionals with the skills to integrate this transformative technology seamlessly into their project lifecycles, enabling data-driven decisions that enhance efficiency, reduce costs, and mitigate risks. This training course is the definitive guide to mastering drone data for superior construction site monitoring and management.

Target Audience / This training course is suitable for:

- Construction Project Managers.
- Civil Engineers.
- Site Engineers and Supervisors.
- Land Surveyors and Geomatics Professionals.
- BIM and VDC Coordinators.
- Quantity Surveyors.
- Construction Planners and Schedulers.
- Quality Assurance and Quality Control Inspectors.
- Health and Safety Managers.
- Asset and Facility Managers.

Target Sectors and Industries:

- General and Commercial Construction.
- Civil Engineering and Infrastructure Development.
- Residential and Real Estate Development.
- Mining, Aggregates, and Quarrying.
- Oil and Gas Infrastructure Projects.
- Renewable Energy Projects (Wind and Solar Farms).
- Governmental bodies, including Public Works Departments and Municipal Engineering Agencies.
- Environmental Management and Landfill Operations.

Target Organizations Departments:

- Project Management Office (PMO).
- Engineering and Design.
- Surveying and Geomatics.
- Operations and Site Management.
- Planning and Scheduling.
- Quality Assurance and Quality Control (QA/QC).
- Health, Safety, and Environment (HSE).
- Contracts and Commercial Departments.

Course Offerings:

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

- Plan and execute safe and effective UAV mapping missions for diverse construction sites.
- Apply principles of photogrammetry and geodesy to ensure high data accuracy.
- Utilize Ground Control Points (GCPs) correctly for precise georeferencing.
- Process raw aerial imagery to generate high-resolution orthomosaics and digital elevation models.
- Create and analyze dense point clouds and 3D reality meshes of construction assets.
- Conduct accurate stockpile volume calculations and earthwork analysis.
- Perform as-built vs. as-designed analysis by overlaying drone data with BIM or CAD files.
- Monitor construction progress through chronological data comparisons and generate insightful reports.
- Integrate drone data workflows into existing project management and reporting systems.
- Identify and assess potential site hazards and compliance issues using aerial data.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be immersive, practical, and highly interactive, ensuring participants can apply their new skills immediately. This course blends foundational theoretical knowledge with extensive hands-on application. The learning experience is built upon a foundation of expert-led instruction, interactive presentations, and open discussions that demystify complex concepts in aerial data processing. A significant portion of the training is dedicated to practical workshops and software simulations, where participants will work with real-world construction site datasets. They will learn to navigate photogrammetry software, process data, and perform critical analyses. Case studies from various construction projects will be dissected in group sessions to understand challenges and best-practice solutions. Collaborative exercises encourage teamwork and peer-to-peer learning, mirroring the collaborative nature of modern construction projects. Continuous feedback from the instructor ensures a deep understanding of the material and builds confidence in applying these advanced drone mapping techniques.

Course Agenda (Course Units):

Unit One Introduction to Drones in Construction

- Introduction to Unmanned Aerial Vehicles (UAVs) and their components.
- The role of drones in the construction project lifecycle.
- Understanding key terminology: Photogrammetry, LiDAR, Orthomosaic, and Point Cloud.
- Review of different types of drones and sensors for construction applications.
- National and international aviation regulations for commercial drone operations.
- Site-specific safety protocols and risk assessment for construction environments.
- Ethical considerations and data privacy in aerial mapping.

Unit Two Aerial Data Acquisition and Mission Planning

- Principles of effective flight planning for mapping and surveying.
- Using automated flight planning software for construction sites.
- Best practices for capturing high-quality aerial imagery and data.
- Understanding camera settings: ISO, aperture, shutter speed, and overlap.
- The role and proper placement of Ground Control Points (GCPs).
- Introduction to RTK and PPK technologies for enhanced accuracy.
- Conducting pre-flight checklists and on-site operational procedures.

Unit Three Photogrammetry and Data Processing Workflow

- Overview of leading photogrammetry processing software.
- Step-by-step guide to the data processing workflow.
- Importing and organizing aerial images and GCP data.
- Aligning photos and generating a sparse point cloud.
- Building a dense point cloud and 3D textured mesh.
- Generating Digital Surface Models (DSM) and Digital Terrain Models (DTM).
- Creating and exporting high-resolution orthomosaics.

Unit Four Data Analysis for Construction Monitoring

- Techniques for measuring distances, areas, and elevations from drone data.
- Performing accurate earthwork and stockpile volume calculations.
- Monitoring construction progress with timeline and change detection features.
- Conducting quality control inspections on structures and earthworks.
- As-built verification by comparing drone data against design files (CAD/BIM).
- Generating cut-and-fill maps for site grading and excavation.
- Creating professional reports and visualizations for project stakeholders.

Unit Five Advanced Applications and System Integration

- Integrating drone-generated point clouds into BIM and CAD software.
- The concept and creation of construction site digital twins.
- Using thermal imaging for building envelope inspections and energy audits.
- Advanced LiDAR data processing and classification.
- Best practices for data management, storage, and sharing.
- Developing a return on investment (ROI) analysis for a drone program.
- Future trends and the evolution of aerial data in the construction industry.

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:

Beyond efficiency and cost savings, how might the widespread adoption of drone-based digital twins fundamentally alter risk management and legal accountability in the construction industry?

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

This course distinguishes itself by adopting a holistic, project-centric approach rather than focusing narrowly on drone piloting or a single software platform. Its core strength lies in teaching the complete data value chain, from understanding the fundamental principles of photogrammetry to delivering actionable intelligence that informs critical construction management decisions. While other courses may teach software-specific functions, this program emphasizes the 'why' behind the 'how', ensuring participants can adapt their skills to new technologies and complex project scenarios. The curriculum is built around real-world construction challenges, focusing on practical applications like as-built verification against BIM models, precise stockpile management, and data-driven progress reporting. It moves beyond technical processing to instill a strategic mindset, enabling participants to integrate aerial data workflows into their organization's existing systems for maximum impact. The emphasis is on critical thinking and problem-solving, preparing professionals not just to operate technology, but to leverage it as a strategic tool for mitigating risk, ensuring quality, and driving project success.