

Case Study: Campus-Wide Reality Capture and As-Built BIM Development

Client: Asheville-Buncombe Technical Community College (AB Tech)

Lead Consultant: LS3P

Reality Capture: Quantum Reality Capture (QRC)

Project Overview

This project involved the comprehensive documentation of existing conditions for 16 buildings at the Asheville-Buncombe Technical Community College (AB Tech) campus in Asheville, NC. The scope encompassed approximately 600,000 square feet of diverse educational infrastructure, including pedagogical spaces, administrative offices, and student service facilities.

The primary objective was the generation of high-fidelity spatial data and scalable digital assets to serve as the baseline for long-term facility management, lifecycle planning, and upcoming capital improvement projects.

Technical Scope & Methodology

To ensure high-density data acquisition with minimal disruption to institutional operations, a terrestrial LiDAR (Light Detection and Ranging) workflow was implemented.

- **Data Acquisition:** Comprehensive interior and exterior scans were performed across the 16-building portfolio. Spatial data was captured to ensure survey-grade accuracy, accounting for complex architectural geometries and MEP (Mechanical, Electrical, and Plumbing) interfaces visible within the plenum and common areas.
- **Data Processing:** Raw scan data was registered and indexed into unified point clouds. These datasets provided the foundational "source of truth" for the modeling phase.
- **BIM Authoring:** The point cloud data was translated into a Building Information Model (BIM) using Autodesk Revit. The modeling was executed to a **Level of Development (LOD) 200** specification, providing accurate schematic representations of elements with approximate quantities, sizes, and locations.

Deliverables

QRC provided a comprehensive suite of digital deliverables designed for immediate integration into design coordination and facility management workflows:

- **LOD 200 Revit Model:** A centralized BIM for multidisciplinary design coordination.
- **2D Documentation:** Coordinated site plans, floor plans, Reflected Ceiling Plans (RCPs), exterior elevations, and roof plans.
- **High-Resolution Point Clouds:** For use in future granular analysis or as-built verification.

Project Execution & Performance

A critical requirement of the engagement was a compressed delivery schedule. The entire lifecycle—from site mobilization and data acquisition to final model delivery—was completed within a **30-to-45-day window**.

Achieving this timeframe required a structured data management pipeline and a high-throughput modeling workflow, ensuring that the transition from physical asset to digital twin was executed without sacrificing dimensional accuracy or data integrity.

Strategic Value

By establishing a robust BIM foundation, AB Tech and LS3P have mitigated the risks associated with legacy "as-built" documentation. The digital assets produced provide:

- **Risk Mitigation:** Reduction in field-verification errors during the design phase of renovations.
- **Operational Efficiency:** A reliable framework for Facility Management (FM) software integration.
- **Scalability:** A digital twin foundation capable of supporting future LOD 300+ modeling or IoT integration for smart campus initiatives.