

Kennedy Square: As-Built Project

Scope Perform as-built survey of Kennedy Square. Deliverables include a 2D planimetric map showing elevations, utilities, and topographic features.

Owner Turner Construction

Date 8/24/04

Background:

METCO Services, Inc., a mid-sized civil engineering and surveying company, acquired a Leica HDS3000 in April 2004. They used it on several projects immediately with outstanding results. Metco not only equips two of their four field crews with traditional survey tools such as levels, total stations and RTK GPS but also with High-Definition Surveying™ (HDS) 3D laser scanning systems and solutions technology. For typical topographic surveys they have realized a 50% average field reduction time and 75% reduction man hour costs using a combination of HDS with traditional survey equipment. METCO uses this combination method on almost all their mid-to-large sized topos and as-builts. They also use it on boundary surveys with zero setback lines (i.e. where property lines are building lines). This project, an as-built survey of Kennedy Square in downtown Detroit, is a good example of how beneficial HDS3000



has been for METCO. Contractors had recently completed a major renovation of this downtown park and gathering place. Final construction as-builts were needed. A key benefit of high-definition surveying, in general, is the ability to avoid lane closures. This site was in the heart of downtown so a traditional survey would have entailed lane closure service expenses and permits. Final deliverables included standard 2D as-built maps with embedded perspective images of point clouds.

Project Workflow:

METCO completed this project with a one person field crew. Eight control points were collected the day before scanning was started. HDS3000 features such as scripting, and full 360°x270° field of view allowed all site scanning plus other site surveying, including sewer and storm invert elevations and field sketches to be completed in one day. Cyclone™ was used to register scans, process point clouds and clean noise. Cyclone's Virtual Surveyor™ was used extensively for fast, easy, point and break-line feature extraction. An added benefit of processing within Cyclone was the rapid 3D visualization of rich point cloud data on potentially ambiguous areas such as differences in elevation on curb cuts, flow lines at catch basins and horizontal locations of building corners (no offsets needed). CloudWorx™ running in conjunction with Autodesk™ Land Development Desktop™ was used for referencing back to the original point clouds and for final drafting, including adding text, legends, title blocks



and mapping symbols. For this project, the Leica HDS3000 minimized time spent planning, both beforehand and on-site. John Brown, CAD Manager at METCO Services, Inc., remarked "High-definition surveying is truly a survey instrument because of the full 360°x270° FOV, the excellent range, and the freedom to scan known control points for real world coordinate registration."

Leica
Geosystems

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Project Facts

Bid: 2.5 field days; 2 person crew; 3 days office

Actual: 1.5 field days; 1 person crew; 2 days office

Deliverable: As built survey map

Benefits

- n 75% labor cost savings
- n 50% faster in field than traditional survey equipment
- n 30% faster turnaround of deliverables
- n Complete; no site revisits
- n No lane closures

Case Studies Civil/Survey

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