Reliable Responsive Solutions

Relentless Pursuit of the Elegant Solution

Elegant [ˈelɪgənt] adj: simple, refined, appropriate, harmonious. We strive for it in all we do.

Our team of professionals includes:

- Surveyors
- GIS Specialists
- CAD Specialists
- 3D Modeling Technicians
- Mechanical Engineers
- Civil Engineers
- Agricultural Engineers
- Chemical Engineers
- Petroleum Engineers
- Process Engineers
- Structural Engineers
- Electrical Engineers
- Funding Administrators
- Technicians and Designers
- Automation and Controls Engineers

We have provided Reliable Responsive Solutions to clients for projects large and small since 1976.
Safety

Ensuring safety is critical; it’s not just about keeping records and maintaining programs. We are committed to providing a safe and healthful workplace, incorporating “best practices” in our policies and procedures, and identifying and correcting risks. Our safety programs and commitment to safety are intended to foster an injury-free, productive workplace. We are proud to have earned the industry’s highest safety ratings and our Experience Modification Rating (EMR) places us as a leader amongst our peers.

In addition to providing an enjoyable, safe, and healthful work environment, we encourage and support employee health and wellness through a variety of fitness-related company activities throughout the year.

Safety and wellness are more than just policies at Cannon—they are cornerstones to how we work in the field and in our offices.
## Overview

### Surveys
- Boundary
- Construction
- Topographic
- Control
- As-Built
- ALTA/ACSM
- GPS-Based Geodetic Control
- Well Borings
- Subsidence/Settlement Monitoring
- GIS Data Collection
- Right-of-Way/Route Survey

### Documents
- Certificates of Compliance
- Legal Descriptions
- Building Certifications
- Oil Well Location Surveys/CDOGGR Certifications

### Mapping
- Final Maps
- Tentative Maps
- Parcel Maps
- Topographic Maps
- Aerial Mapping
- Record of Survey Maps
- Lot Line Adjustments
- ALTA Maps
- Mapping and Platting
- Constraints Analysis
- Right-of-Way Mapping

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Cannon
Projects

Utility Base Mapping
Santa Monica, California
Santa Monica Community College selected Cannon to provide land surveying services in support of planned projects at the Santa Monica College, Main Campus. The Main Campus is roughly 1.7 million square feet. Of that, approximately 1 million square feet required utility base mapping services. Cannon conducted a limited survey, which provided the position and alignment of underground utilities. The field survey data was then used to create an AutoCAD drawing. The utility data was collected and exhibited in Cannon’s CAD deliverable and registered to the project survey controls. The data was “layered” according to utility type (water, storm drain, gas, etc.).

Boundary Survey for Trilobite Solar Project
Barstow, California
The Trilobite Solar Project is a 6,000 acre parcel of land situated in the County of San Bernardino, designated for sustainable, large-scale energy production. Cannon was selected to provide ground control for photogrammetry mapping, and to conduct a field survey of the property to recover boundary evidence. To establish horizontal and vertical control, Cannon placed approximately 80 aerial panels on the site. In addition, Cannon obtained record boundary data from County and State agencies. This information was used in the preparation of a Record of Survey Map and was used to retrace and re-establish boundaries.

Construction Survey for Regional WWTP Upgrade
Lompoc, California
As part of the City of Lompoc’s Regional Wastewater Treatment Plant (WWTP) upgrade, Cannon was selected to provide construction survey services for the new structures and pipelines. Cannon’s scope of work included establishing horizontal and vertical control; staking and certification for rough grading; settlement monitoring of existing storage tanks and buildings; and staking and as-built certification of oxidation basins, new facilities, storage tanks and pipelines.

Land Survey Services for PG&E’s Service Territory
Northern and Central California
Pacific Gas and Electric (PG&E) owns approximately 270,000 acres of property and operates thousands of miles of both electric and gas transmission and distribution lines, hydro facilities, and substations within 48 counties of California. Cannon was selected to perform land surveying services for PG&E on an as-needed basis throughout their service territory. Cannon assisted PG&E in meeting business needs in construction of new facilities, as well as management of existing company facilities. Surveying services included route surveys, property (boundary) and control surveys, topographic surveys, records-of-survey, monitoring surveys, right-of-way, aerial topographic surveys, and construction surveying.

CannonCorp.us
3D Scanning & Modeling

Overview

Architecture
- Architectural As-built Documenting
- Building Façades
- Interiors
- Historic Building Preservation and Renovation
- Direct Horizontal and Vertical to Develop “What If” Scenarios
- Visual Surface and Texture Analysis
- Access, Safety, and Constructability Analysis
- Building Information Modeling and 3D Visualizations

Public Infrastructure
- Detailed 3D Models
- Buildings (Interior and Exterior)
- Bridges and Support Structures
- Railroads and Tunnels
- Roadways/Intersections
- Parkways and Landscaping
- Reservoirs, Dams, Levees, and Drainage Channels
- Landfill and Mining Excavations
- Profiles, Cross-Sections, and Earthwork Quantity Verification
- Hydrology and Floodplain Mapping
- Tree and Ground Cover (Habitat) Mapping

Oil & Gas, Power Generation
- 3D Pipeline and Facility Models
- Visual Constraints and Conflict Analysis
- Access, Safety and Constructability Analysis
- Digital Color Mapped Visualizations and “Fly Throughs”
- As-Built Site Surveys for Certification and Regulatory Compliance
- Power Line and Electrical Facility Management Using GIS

Forensics
- Existing Site Conditions
- 360° Digital Photography Overlay on 3D Model
- Deformation and Subsidence Monitoring Surveys
- Quality Assurance for Permitting and Certification
- Basis for Assessment Studies for Litigation Protection
- Clearance Evaluations for Industrial Safety Reviews
Projects

3D Laser Scanning for Space Launch Complex 6
Vandenberg, California
Cannon provided 3D scanning and modeling services to the United Launch Alliance Team for pre-launch safety certifications of the Mobile Services Tower (MST). Cannon digitally captured the existing MST, then incorporated this data with a 3D model of the Delta IV Rocket. The resulting 3D model enabled Cannon to perform detailed analysis of the clearance between the Delta IV Rocket and the multiple service platforms of the MST. This use of technology provided significant cost and time savings as compared to conventional approaches to retrofitting the MST service platforms.

3D Laser Scanning for Cal Tech Linde + Robinson Laboratory
Pasadena, California
The 78-year old laboratory at California Institute of Technology (Cal Tech) was slated to become a state-of-the-art facility for the Cal Tech Linde + Robinson Laboratory for Global Environmental Sciences. Cannon provided 3D scanning services of the existing laboratory, approximately 45,000 gross square feet. The 3D scan provided the design team accurate measurements (within 5mm) and aided design professionals in modeling and analyzing the site remotely, thus providing Cal Tech an opportunity for cost savings.

Cannon’s scope of the work included a 3D scan of the interior floors, walls, and ceilings of the sub-basement, basement, ground floor, first floor, second floor, and rooms on the roof and roof deck. Cannon established horizontal and vertical control points within the building’s interior and tied data into existing horizontal and vertical control.

3D Scanning for Dana Adobe Restoration
Nipomo, California
In an effort to continue restoration of the Dana Adobe, Cannon provided 3D scanning services to aid in the preservation of this historic landmark.

Using 3D scanning technology, Cannon digitally captured and preserved current conditions and dimensions of the Dana Adobe. The information generated from these scans aided design professionals in modeling and analyzing the site before it was restructured. This 3D information helped in the renovation of the Dana Adobe by saving the organization time and money by analyzing retrofits on the computer rather than on the structure itself, thereby, saving in costly revisions.

Pecho Coast Trailhead Access Bridge Design Alternatives
Avila Beach, California
PG&E, in coordination with the Port Harbor District, selected Cannon to prepare a study of design alternatives for a stairway that would provide public access to the Coastal Trailhead in Avila Beach. To begin, Cannon conducted a 3D scan of the existing environment. This information was used to create a base map for design of cast-in-place concrete supports at the base and upper landing, as shown in the conceptual site drawing. Then, Cannon prepared working exhibits and preliminary design concepts to convey the conceptual project design for agency and community reviews.
Geographic Information Systems

Services

- Facility Management
- Data Inventories
- Infrastructure Inventories
- Spatial Analysis
- 3D Modeling
- GIS Deliverables
- Parcel Management
- Building Information Modeling (BIM)
- Aerial Imagery Solutions
- Cartographic Quality Digital Maps and Paper Plots
- 3D Scan Data Management
- Enterprise and Web-Based GIS Services and Solutions
- GIS Implementation and Training
Projects

GIS Pipeline Inventory and Facilities Assessment
Santa Maria Valley, California
Cannon was selected to compile a comprehensive inventory of all pipelines and facilities for an oil facility. As part of the inventory, Cannon was asked to identify areas where pipelines were either in, or adjacent to, developed areas or areas of potential development.
Cannon compiled and reviewed available records and then created a mosaic of record drawings. This graphic showed an overview of the project area, as well as called out pipelines within the project area.

GIS for ALTA Survey
Orcutt, California
As part of a multi-use development, Cannon was selected by Wells Fargo Bank to prepare an ALTA survey. Cannon’s scope of work included use of ESRI's ArcMap GIS software to prepare an updated Property Ownership Exhibit Drawing showing owner’s name, tax assessor’s parcel number and an APN Listing of all client owned and adjacent parcels. The GIS Map was created by incorporating County GIS information, AutoCAD drawings and MS Access Database information into an ArcMap Project to create the desired layout format, informational content, color coding, and legend as requested by the client.
Using ESRI’s ArcMap GIS software, Cannon was able to quickly create an enhanced Parcel Ownership Exhibit with APN and Ownership listings. This exhibit proved a valuable resource throughout the project for coordination of the Deed Title Ownership and Easement reviews.

Electrical Facilities Atlas Map
Ventura, California
Aera Energy selected Cannon to update their Ventura Field Electrical Facilities Atlas Maps. This update included locations for wells, pumps, power poles, overhead electrical lines, and associated facilities. Cannon coordinated development of prototype drawing standards. The final product showed the aerial orthophotograph screened back so existing improvements and roads were highly visible, while maintaining clear and legible electrical lines and facilities for daily use by the field engineers and facility managers. The final maps were also used by the field inspectors and maintenance personnel.

Pipeline QA/QC Review
Arroyo Grande, California
Cannon was selected by PG&E to perform reviews and verify pipeline segment information contained in their GIS database related to their Pipeline Safety Enhancement Program. The scope of work included review and verification of pipeline ID and location data: City and County name; tax assessor’s parcel number; City-County jurisdiction; pipeline route ID; segment number and length; and distance to nearest adjacent City boundary and City center. Cannon provided PG&E with updated .SHP and .MXD GIS project files, an updated Excel spreadsheet and MS Access database and .KMZ overlay for Google Earth.
Due Diligence

“The degree of care that a prudent person would exercise, which is a legally relevant standard for establishing liability. The disclosure, to potential buyers, of all relevant information that applies to a security or property.”

Services

- American Land Title Association (ALTA) Surveys
- Boundary Analysis/Record of Survey
- Deed and Title Research
  » Title Exception/Easements and Leasehold Analysis
  » Ownership Research Through Public Records
  » Lot Analysis
- Zoning and Land Use Reviews
- Flood Elevation Certificates/Flood Zone Analysis
- Site Condition Studies
  » Erosion, Debris, and Materials Stockpiles
  » Infrastructure Impact Analysis
  » Undocumented Access
  » Encroachments
- Topographic Surveys
- Underground Utility Plans/As-Built
- Site Investigation Reports (Habitat, Environmental, Hazard)
Projects

45-Mile Pipeline Mapping and Right-of-Way Survey
San Luis Obispo County, California
Cannon was selected to provide professional surveying, mapping and right-of-way acquisition support services for the Nacimiento Water Project. This water-delivery project spans a 45-mile pipeline corridor, with several pump stations and multiple storage tanks. Cannon's scope of work included topographic field surveys, aerial mapping, property boundary and right-of-way determinations, legal descriptions, and exhibit drawings. The topographic information was the basis for the design of the pipeline and water handling facilities. The legal descriptions and exhibits were used in negotiating temporary easements and permanent right-of-way acquisition across more than 60 parcels.

3,000 Acre ALTA Survey and Record of Survey
San Luis Obispo, California
California Polytechnic State University's Facilities Management Department selected Cannon to provide an ALTA survey and file a record-of-survey map for more than 3,000 acres of the University's land parcels adjacent to a regional military base. The ALTA and boundary survey provided an accurate basis for updating lease agreements and identifying areas where access and utility easements needed to be acquired. The project required detailed research of historical government land title records and review of over 300 unrecorded survey drawings and deeds. In addition to the research and analysis of the University's land records, Cannon reviewed City and County Records, CalTrans ROW Maps, State Park Lands Maps, Government Land Office Sectionalized Land Survey notes from the 1800s, Parcel and Subdivision Tract Maps, and Records of Survey.

11,200 Acre Boundary Survey
San Luis Obispo, California
The California Army National Guard selected Cannon to execute a boundary survey for one of its military bases. The scope of work included performing a “Dependent Resurvey and Subdivision of Townships and Sections” within the Public Land Survey System and setting approximately 50 boundary corner monuments. Cannon researched historical land records, performed a field boundary survey in accordance with the California Business and Professional Code (Land Surveyor’s Act), BLM Manual of Instructions for the Survey of Public Lands Surveys and ACSM/NSPS Accuracy Standards for Survey Measurements Controlling Land Boundaries. The Survey also included setting monumentation on railroad right-of-way and Historical Creek boundaries that ran through the property.

580 Acre ALTA Survey
Orcutt, California
Cannon was selected by Wells Fargo Bank to prepare an ALTA/ACSM Land Title Survey. The ALTA survey covered multiple developed and undeveloped phases of the Rice Ranch Project. This included showing all existing improvements, surface and underground utilities, and multiple Table-A Items required for certification of the ALTA Map. The survey covered over 580 acres and required a thorough and comprehensive level of “Due Diligence” to ensure all Ownership Rights and Exceptions described in multiple Title Commitments were accurately identified.