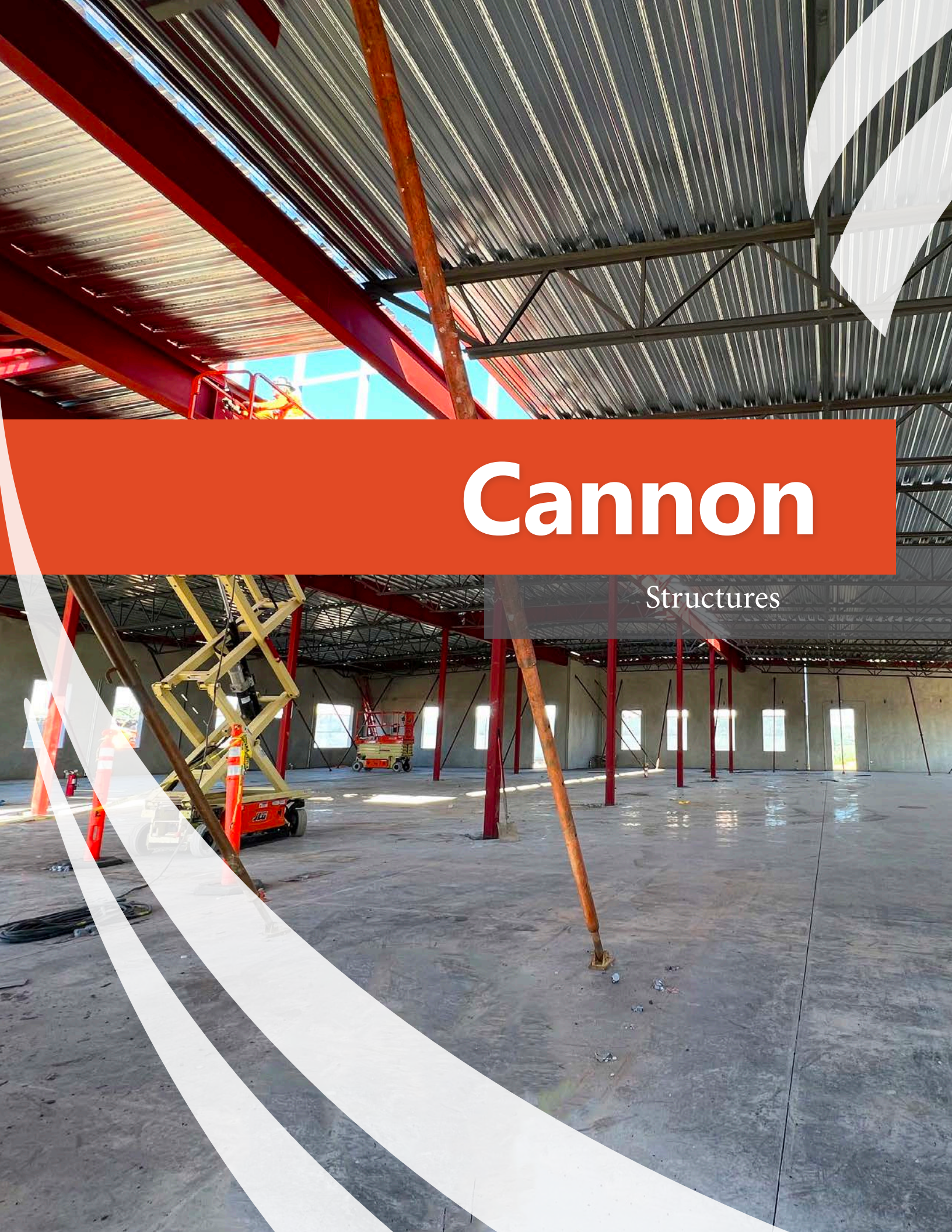


Cannon

Structures

Reliable Responsive Solutions

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

Our team of professionals includes:

- Structural Engineers
- Civil Engineers
- Automation and Controls Engineers
- Process Engineers
- Mechanical Engineers
- Electrical Engineers
- Chemical Engineers
- Petroleum Engineers
- Surveyors
- GIS Specialists
- Funding Administrators
- Technicians and Designers

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.

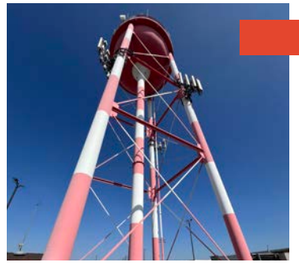
In addition to providing an enjoyable, safe, and healthful work environment, we encourage and support employee health and wellness through a variety of fitness-related company activities throughout the year.

Safety and wellness are more than just policies at Cannon–they are cornerstones to how we work in our facilities and yours.

Infrastructure

Cannon

Projects



Elevated Water Tank

El Monte, California

The City of El Monte sought structural engineering services to evaluate the seismic performance and overall condition of a 200,000-gallon elevated water tank. Cannon conducted a seismic evaluation in accordance with ASCE 41-17 to determine the tank's ability to withstand regional seismic forces and identify functional vulnerabilities. Our team analyzed corrosion impacts on the structure, and provided clear recommendations for seismic retrofitting to provide long-term performance and safety. Cannon also supported the Initial Environmental Impact Study, outlining any structural improvements that could trigger CEQA review. This comprehensive evaluation equipped the City with the data needed to plan effective upgrades and maintain critical water infrastructure.

San Luis Obispo Creek Emergency Repair at San Luis Drive

San Luis Obispo, California

In January 2023, San Luis Obispo experienced its heaviest rainfall since 1969, the second highest on record. After storm damage occurred along San Luis Creek near San Luis Obispo High School, the City retained Cannon to design an emergency soldier pile wall to stabilize the creek slope, prevent further erosion and sliding, and protect San Luis Drive and adjacent utilities. Further storm damaged occurred in March when a section of the creek bank along San Luis Drive collapsed, undermining the sidewalk and creating an immediate hazard to the roadway and underground utilities, including gas and diesel fuel lines. Cannon worked closely with the City, participated in frequent coordination meetings, and provided integrated civil, structural, and survey services.

Madera and Stearns South Tanks

Simi Valley, California

Cannon provided structural engineering services for the seismic retrofit and rehabilitation of the Madera and Stearns South tanks, critical components of the Ventura County Waterworks District's water storage system. The work included evaluation of existing seismic and structural deficiencies, detailed structural analyses, and the design of retrofit measures to bring both tanks into compliance with current seismic and building codes. Cannon assessed the tank foundations, shells, roof framing, anchorage, and freeboard, as well as the development of constructible structural details and specifications. Cannon's designs strengthened seismic resilience, prolonged the tanks' service life, and improved public safety; while reducing operational disruptions and reinforcing the long-term reliability of the District's water infrastructure.

Historic Olivas Adobe Wall Repair

Ventura, California

Cannon provided structural engineering services to the City of Ventura for the repair of the historic Olivas Adobe. The team evaluated existing cracking, material deterioration, and prior repair conditions affecting the exposed adobe wall. Cannon developed a sensitive structural repair design that addressed weakened adobe, redistributed lateral loads to the roof and floor diaphragms, and reduced future cracking while preserving the structure's historic character. Services included site observations, preparation of stamped structural drawings and calculations, coordination with City staff, and support through plan check, bidding, and construction administration. The repair improved long-term durability, structural performance, and weather resistance of this nationally recognized historic resource.

New Construction

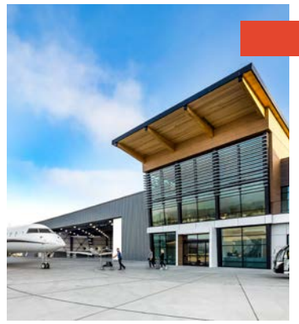
Cannon

Projects

Operations Support Facility

Naval Base Coronado, California

The U.S. Navy constructed a new Operations Support Facility to enhance administrative and operational functions at Naval Base Coronado. Cannon provided structural engineering services for the facility's design and construction. The team designed a concrete and metal deck roof system with tilt-up concrete shear walls to resist seismic load, while addressing roof drainage through integrated drainage systems. For the walls, Cannon designed tilt-up concrete to handle operational loads and blast load requirements. Panel joints needed to be carefully placed around large openings to confirm the overall stability of the facility. Challenges included managing roof weight, confirming the walls could handle blast loads, and addressing soil conditions near the coast. Cannon solved these issues with detailed structural analysis and design adjustments. The outcome was a structurally sound, adaptable facility that met the Navy's operational needs and provided long-term durability.

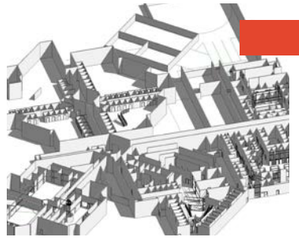


ACI Jet Headquarters and Hanger 2

San Luis Obispo, California

To accommodate more clientele, Aviation Consultants, Inc. (ACI) endeavored to build a new headquarters facility and expand an existing aircraft hangar at the San Luis Obispo County Regional Airport. The expansion included a new multi-story headquarters office building and a new aircraft hangar, more than doubling the size of the existing facilities.

Cannon designed the structural framing and foundation for the new headquarters multi-story building. Seismic separation, cantilevered walkways, balconies, and bridges connecting key building elements. Services included reinforced concrete and steel framing design, foundation systems, screen walls, and rooftop features. Cannon also prepared structural calculations and construction documents, supported plan check, and provided construction administration, revisions, and coordination to accommodate evolving design requirements and to confirm constructability and long-term performance.



Santa Barbara County North Branch Jail

Santa Maria, California

The County of Santa Barbara Northern Branch Jail Project is located near Santa Maria, California. The project included a 376-bed jail facility, 32 of which are medical or mental health beds located in a specialized housing unit. The facility was built on a portion of a 50-acre property located at the crossroads of Black and Betteravia. The total project budget was estimated to be $96.1 million, including site acquisition, planning, and soft costs. Cannon was contracted by Rosser International, Inc. to assist with schematic design, design development, construction documents, and construction administration.

Moylan Terrace

San Luis Obispo, California

Cannon was selected to provide structural design services for this multi-family residential project consisting of 80 single-family attached homes for the Housing Authority of San Luis Obispo. The Moylan Terrace project consists of units of six unique two- and three-story layouts configured into two building types that feature two separate roof slope configurations. Cannon provided structural calculations, plan, and detail drawings sufficient to acquire a permit to construct the structural portions of the project.

Industrial Structures

Cannon

Projects

Strainpress Platform

Ventura, California

To support new processing equipment with a durable, site-specific solution, a custom strain press platform was designed to accommodate two new strain press units and associated control cabinets. Cannon provided structural engineering for the approximately 9-foot by 19-foot platform, which used braced frames for lateral resistance and stainless steel construction for corrosion resistance. The design included an access walkway to the adjacent concrete structure, guardrails, and an elevated configuration that allowed level access and waste receptacle clearance. Steel checkered plate decking was incorporated for slip resistance and durability. Foundations consisted of a mat slab designed per geotechnical recommendations to resist overturning without exceeding soil bearing limits. Cannon also provided construction administration, supporting a smooth, issue-free installation.

Baghouse Expansion Foundation

Lompoc, California

Cannon provided multiple services for the addition to an existing predesigned metal industrial building. The design included a robust foundation to support equipment loads exceeding 80,000 pounds. Cannon's structural engineering services included detailed analysis and design of the baghouse foundation, supported by a complete calculation package and structural drawings for permit, bid, and construction. The drawing set included foundation details, partial plans, typical details, and required notes and special inspections to streamline review and construction. As the design advanced, Cannon coordinated with the building manufacturer to incorporate reaction loads and anchorage layouts into the final foundation design. Cannon also responded to agency plan check comments and issued stamped construction documents.

FWKO and MCC Relocation

Playa del Rey, California

Supporting a complex industrial process environment required structural solutions capable of accommodating heavy pressurized vessels, dense piping networks, and challenging subsurface conditions. Cannon provided structural engineering services that included design of mat foundations with pedestals for large pressurized vessels and structural steel pipe supports for multiple process lines and electrical conduits. Pipe bridges and pipe racks were designed to span across an active facility with highly congested piping. Due to poor soil conditions, most foundations utilized drilled piers, requiring close coordination with the geotechnical engineer. Cannon also analyzed existing pipe racks for new pipe loads and coordinated with third-party CAESAR pipe stress analysis. Construction administration services were provided, including redesigns when unforeseen underground obstructions were encountered.

San Emidio Magnet Frame Design

Bakersfield, California

Supporting new industrial equipment installation required precise structural design and careful integration with existing facilities. Cannon provided structural engineering services for the design of a new steel magnet support frame and performed structural analysis of its attachment to an existing steel tower at the San Emidio Plant. Work included a site visit to verify tower geometry, member sizes, and potential construction conflicts, followed by development of a preliminary frame concept and primary member sizing for fabrication. Cannon also evaluated the existing tower load path to confirm adequacy under the added frame loads, and prepared detailed construction drawings and a stamped calculation package to support fabrication and installation.

Structural Rehabilitation

Cannon

Projects

Roof Collapse Investigation

El Monte, California

When a roof collapse threatened ongoing operations at a transportation services storage building, Cannon responded with a rapid structural investigation and repair guidance. Our team conducted an on-site assessment of a nearly 24-foot by 24-foot roof collapse and evaluated the resulting impacts on the tilt-up building's lateral stability, recognizing the roof diaphragm's critical role in bracing the perimeter walls. Cannon identified probable failure causes related to clogged roof drainage and rainwater ponding, and issued immediate safety recommendations, including temporary shoring, and the establishment of restricted access zones. Repair recommendations included replacement of water-damaged engineered lumber joists and ledgers; restoration of roof sheathing, drains, and scuppers; and repair of damaged lighting and fire sprinkler components.

Structural Assessment & Shoring Design for Water Utilities Office

Downey, California

The City of Downey needed structural engineering services to evaluate its Water Utilities Division office. The facility is a single-story, wood-framed structure with partially reinforced CMU perimeter walls. A fire compromised the roof, interior framing, and portions of the building's lateral force resisting system. The City's goal is to safely demolish the damaged framing while retaining the existing CMU shell to allow for future reuse. Cannon was selected to provide a preliminary coordination and hazard survey, structural observation and damage assessment, temporary shoring design, and construction support during temporary shoring installation.

Parking Structure Stair Tower Replacement

Ventura, California

Coastal exposure had deteriorated this beachfront parking structure, causing extensive cracking, corrosion, and concrete spalling. Cannon provided structural engineering services to evaluate the structure and develop a long-term, performance-based repair strategy. The team completed an ASCE 41 seismic evaluation to establish performance objectives and identify weaknesses in the vertical and lateral force-resisting systems. Results were used to create a repair plan that supported construction cost estimating and informed future planning. One key upgrade addressed the southeast stairwell, where spalled precast elements and corroded connections required replacement. Cannon prepared schematic plans and construction documents for stairwell demolition and reconstruction, including permit-ready drawings and details sufficient for construction of the new stair tower.

Pier J Berths 243-247 Wharf Concrete Repairs

Port of Long Beach, California

As part of an existing on-call contract between the Port of Long Beach, Cannon provided repair details for structural damage documented by others in 2019 at Pier J. The inspections included both above and below water observations documented in photographs and written summaries. Cannon prepared and submitted repair drawings for damage classified as severe to major alongside engineer construction cost estimate. The pier consists of a concrete working surface supported by pre-cast concrete piers driven into the seabed. The repair drawings addressed specific damage types at each of the repair locations and included treating exposed rebar, patching spalled concrete, injecting cracks, and protective fiber reinforced wraps.

Seismic Evaluation

Cannon

Projects

Permanent Un-housed Shelter Seismic Evaluation and Retrofit

El Monte, California

Through the Homekey Homeless Initiative, Cannon supported the City of El Monte in upgrading two existing motel properties, the M Motel and Budget Inn, into safe and functional interim and permanent housing for individuals and families. Cannon conducted structural integrity evaluations and ASCE 41 Tier 2 seismic evaluations for both two-story, Type V buildings, identifying deficiencies in the existing seismic force-resisting systems. Based on the findings, Cannon developed structural retrofit designs and construction-ready drawings to strengthen the facilities and support remodel improvements. Cannon's scope included evaluation of as-built conditions; selective wall removal and reconfiguration; the creation of new corridors; accessibility and circulation upgrades; and the addition of structural framing where required. Cannon also designed replacement stairs and guardrails, and provided construction administration during retrofit implementation.

Police Headquarters Seismic Evaluation

Ventura, California

The Ventura Police Headquarters, constructed in 1981, serves as a critical public safety facility for the community. The City of Ventura initiated a comprehensive seismic evaluation to assess the building's infrastructure. The two-story structure, partially below grade on one side, relies on concrete and masonry shear walls for its lateral load-resisting system. Cannon reviewed existing drawings and prepared seismic evaluation in accordance with ASCE 41 Tier 1 and 2 to identify deficient elements of the lateral load path and develop repair concepts. Cannon also conducted structural analyses including a finite element computer model of the building to model elements and connections to determine deficiencies. Based on Cannon's evaluation, deficient structural members were identified and conceptual retrofit skims were provided.

Ventura Event Center

Ventura, California

Renovation of the Ventura Event Center at the Buenaventura Golf Course required a comprehensive structural evaluation to support expanded event use and facility upgrades. Cannon provided a seismic evaluation of the existing two-story wood-framed structure, which included evaluation of a plywood roof diaphragm, sawn lumber joists and beams, partial slab-on-grade construction, and perimeter wood shear walls. As part of the scope, Cannon conducted site investigations to identify damaged or deteriorated elements, reviewed record drawings, and evaluated vertical and lateral load paths. During the seismic assessment, Cannon analyzed diaphragm behavior, shear wall capacity, overall lateral system continuity, and developed conceptual repair and strengthening strategies to improve performance. Deliverables included a stamped structural report, repair plans, and an engineer's construction cost estimate.

Coke Tower Base Repair

Trona, California

To keep critical industrial operations running with damaged coke tower base required a targeted structural evaluation and repair design. Cannon completed an assessment of the existing tower foundation and the bottom 17 feet of the tower, followed up by a permanent base repair design. This included development of gravity, wind, and seismic loading to verify structural demands and identify deficiencies. Based on the findings, Cannon designed a permanent base repair to maintain tower operation during construction, using stiffener plates and doubler plates to strengthen the damaged section. Cannon delivered construction-ready structural drawings and calculations with plans, material specifications, and detailed repair information to support implementation and long-term performance.

CannonCorp.us

Forensics

Cannon

Projects

NAVFAC Conversion of Bachelor Enlisted Quarters

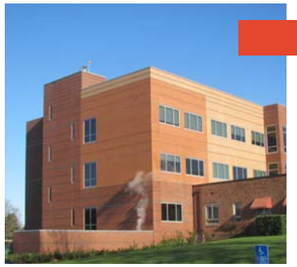
Camp Pendleton, California

Converting an existing Bachelor Enlisted Quarters (BEQ) into a mixed-use BEQ, administration, and training facility required detailed evaluation of structural performance and upgrade needs. Cannon completed an ASCE 41-17 seismic evaluation for Building 33612 at Camp Pendleton, assessing the existing lateral force-resisting system and load paths. Cannon also coordinated with the design team to support the new interior layout, including removal of load-bearing walls and evaluation and reinforcement of floor slabs for increased occupancy loads. During construction, Cannon investigated existing cracks exposed in elevated slabs, documented conditions, directed non-destructive testing, and developed a proposed FRP strengthening solution.

Panattoni v. Opus and Stellar Structures

Summer, Washington

Panattoni Development Company is one of the largest privately owned industrial real estate developers in North America. Panattoni contracted Stellar Structures to construct 31 commercial warehouses featuring wood roof diaphragms and concrete or masonry exterior/perimeter walls. During the re-roofing of one of the warehouse structures, repetitive loading from a heavy cart hauling materials across the roof caused a 2x4 wood roof joist to fall from the ceiling. The Developer, Opus, retained Wiss Janney Elstner (WJE) engineers to investigate the cause of the failure. WJE noted, during their investigation, that a small percentage of the roof joists had conditions that could reduce their support capacity. Cannon worked with WJE to determine the expected incidence and protocols for repair.



Santiam Memorial Hospital

Stayton, Oregon

Santiam Memorial Hospital is a not-for-profit, 50-bed acute care facility serving more than 30,000 people annually. After completion of a new four-story wing, the hospital filed suit against the contractor and subcontractors for alleged defects, including excessive floor deflection. Cannon was retained on behalf of Marion Construction to perform structural surveys and analysis. The team documented as-constructed conditions, compared measured deflections to allowable limits, and clarified applicable construction tolerances. Cannon also provided expert testimony during arbitration. The arbitrator ultimately awarded no damages to the hospital from the contractor or Marion Construction.

American Honda v. Opus and Stellar Structures

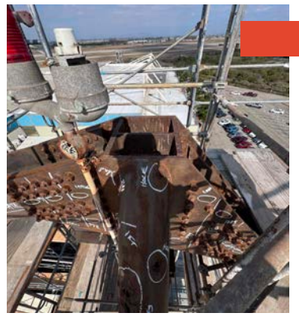
Gresham, Oregon

Stellar Structures constructed a large structure in Gresham, Oregon along the Columbia River Gorge. The facility contained a large parts distribution warehouse with attached offices and a training facility. A segment of the roof collapsed due to a large snowstorm followed by rain. Honda brought suit against the developer, Opus, Stellar Structures, the A/E firm that designed the structure, and the special inspection company alleging defective construction. Cannon was retained on behalf of Stellar Structures to review the allegations and reports by Honda's experts. Cannon performed independent investigations and evaluations, developed a repair scope based on construction deficiencies, and provided expert testimony in court.

Defense

Cannon

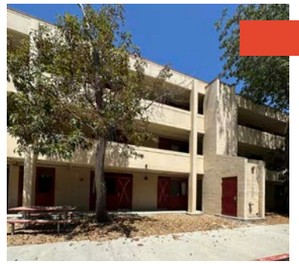
Projects



Naval Base Emergency Repair Hangars

Point Mugu, California

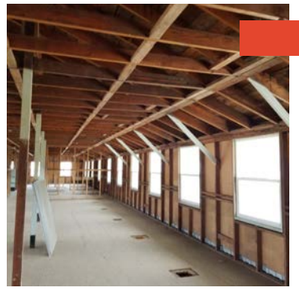
Extensive corrosion and cracking in cantilever mast systems required immediate structural repairs at Hangars 553 and 323 at Point Mugu Naval Base. Cannon conducted field investigations, documented deteriorated connections, and reviewed ultrasonic non-destructive testing data to confirm repair needs. Our team evaluated a shoring-based approach and identified major constructability and operational impacts, including excessive deflection and the need for hydraulic repositioning. To keep hangar bays operational during construction, Cannon developed an innovative bypass structural system capable of carrying full mast loads while corroded connection plates were removed and replaced. This solution eliminated reliance on disruptive temporary shoring and provided a practical installation sequence. Cannon delivered evaluation, analysis, repair design, construction drawings, calculations, and construction administration services for both sites.



Bachelor Enlisted Quarters Modernization

Camp Pendleton, California

Modernizing an existing Bachelor Enlisted Quarters (BEQ) at Camp Pendleton required targeted structural repairs and upgrades to support new program needs. Cannon provided structural engineering services for the repair and conversion of BEQ 53450, including an ASCE Tier 1 seismic evaluation and design of improvements required for usage change. Work included repairs to concrete floor slabs, perimeter walkways and walls, and stair towers at the building ends. Cannon evaluated existing structural elements where walls were removed or new openings were introduced, and designed a new elevator tower to improve accessibility. Additional scope included a new transformer pad, structural specifications and design, and addition of secondary sloped roof framing.



Building 3019 Renovation

Camp Roberts, California

Cannon coordinated full design team services for the renovation of Building 3019 at Camp Roberts. The project involved upgrading an existing two-story, wood-framed facility originally constructed in the 1940s. Cannon coordinated and provided services for design of interior and exterior modifications including civil, structural, architectural, mechanical, electrical, plumbing, and fire systems. Structural services included evaluation of framing at new window openings and infills, as well as infill framing where an interior stairwell was removed. The scope also covered design of a new exterior stair and supports for required egress, a new exterior porch, evaluation of existing conditions, and support requirements for new fire sprinkler piping. Cannon prepared structural plans, primary details, specifications, and Basis of Design documentation.

March Air Reserve Base Training Center

Moreno Valley, California

Mission-ready training operations were supported through structural engineering for a new 40,096-square-foot Training Center at March Air Reserve Base. Working with Ravatt Albrecht & Associates, Cannon delivered structural design services for a single-story facility constructed with reinforced concrete masonry units (CMU) to serve as a Naval Operations and Supply Center. Cannon completed conceptual structural design and advanced the project through multiple design reviews and phased submittals, producing a full set of structural construction drawings and a comprehensive calculation package to support permitting and construction.

Aerospace

Cannon

Projects

Air Separation Unit

Starbase, Texas

Rapid site development for a new Air Separation Unit (ASU) plant required structural solutions that balanced heavy dynamic industrial loads, coastal hazards, and sensitive site constraints. Cannon delivered structural engineering for pile-supported MAT Slab platforms supporting multiple facilities and equipment skids, along with the complete design of a water cooling building for hurricane and blast/launch loads. Cannon also designed retaining walls to support roadways adjacent to protected wetlands and engineered a concrete screen wall along Highway 4 to resist hurricane winds and launch blast/splash demands. As project requirements evolved, Cannon completed expedited redesign and value engineering of the retaining wall foundations to reduce deep foundation needs, incorporate revised launch loads, and quickly reissued updated construction documents to support an accelerated schedule.

Space Launch Complex Crown Storage Rooms

Santa Barbara, California

To support launch operations and improve access near the launch table at a Space Launch Complex, a new two-story storage building was developed within a constrained, equipment-dense area. Cannon designed the building foundations to integrate new column loads into an existing concrete foundation element from the original track construction. Doing this avoided major demolition while maintaining compatibility with surrounding infrastructure. The steel-framed structure included elevated access bridges and grating walkways connecting to adjacent facilities. Cannon conducted on-site structural observations at key milestones to verify conformance with the structural plans and support quality control through project closeout. In addition, Cannon also provided construction administration services, including RFI responses, steel shop drawing review, and coordination of rolling door detailing.

Test Stand Tower

Cedar Park, Texas

To expand high-capacity aerospace testing at a Texas facility, a 140-foot structural test stand tower, was engineered to support demanding vertical and horizontal load cases while maintaining safe access and operational flexibility. Cannon delivered phased structural design for the steel tower, including a 26-foot open gap for specimen maneuvering, provisions for utility runs, and adaptable landing locations. The tower was designed for 50-kip vertical loading, 50-kip horizontal test loads at multiple locations, and wind demands up to 135-mph hurricane conditions. Cannon prepared stamped structural drawings and calculations for permitting and construction, along with foundation design for tower columns and the test base. Additional services addressed revised load combinations, brace configuration changes, phased design, and pile foundation engineering. Cannon also provided construction administration support through meetings, site visits, RFIs, and shop drawing review.

Launch Complex

Cape Canaveral, Florida

Restoring safe access at a coastal launch complex required durable structural upgrades for deteriorated stairs and guardrails at a launch complex. Cannon provided structural design for the demolition of the existing concrete stairs and steel guardrails with new steel stair systems and modular guardrails. The design approach incorporated side-mounted guardrail posts with bolted connections to existing concrete walls to support efficient installation and future removability as site needs change. Cannon also reviewed available as-built drawings and advanced the work through phased submittals, delivering both 60% conceptual drawings and 100% for-construction structural documents to support fabrication and installation.

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