Devon Lumbard, SE

Associate Principal

Education

M.S., Civil Engineering
University of California, San Diego, 2005

B.S., Civil Engineering
University of California, Davis, 2003

Professional Registration

CA Civil Engineer, License No. 71487

CA Structural Engineer, License No. 5552

Qualifications

Devon Lumbard joined Degenkolb Engineers in 2005 after receiving his Masters of Science degree from the University of California, San Diego. His portfolio reflects an ability to successfully handle complex projects in various Degenkolb market sectors. He has particular interest in structural analysis, forensic analysis, and seismic evaluation and retrofit design. His experience includes evaluation and designof concrete, steel, timber, and masonry structural systems, as well as construction means nad methods engineering. Devon's expertise in advanced analysis has saved clients millions of dollars in construction costs.

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Professional Affiliations

Structural Engineers Association of Northern California, Existing Buildings Committee

American Wood Council - Wood Design Standards Committee

Earthquake Engineering Research Institute

American Institute of Steel Construction

Teaching Experience

Instructor, Portland State University
Statics, Concrete Design

ATC-20 Trained

Forensic/Litigation Support

Davis Rothwell Earle Xoxhihua, Expert Witness
Expert Witness services related to floor flatness and floor levelness concerns related to steel framing deflections, concrete placement and finishing techniques. The steel framing design was analyzed and compared to allowable steel fabrication tolerances to evaluate sources of deflection and compared to specification requirements.

Office Complex, Litigation Support
The project began when janitorial staff found pieces of concrete on the floor of an office building. We were retained to assess the damage of a steel beam connection to a concrete wall, and quickly design emergency repairs before a snow storm could overload the damaged connection. We were ultimately retained as prime consultant by the plaintiff to investigate the 400,000 square foot tilt-up office complex and design repairs for numerous construction defects and design flaws. Serving as construction manager, we ensured the contractor, design team members, and owner coordinated construction schedule and impacts to occupants in the fully occupied facility.

Chemawa Indian School, Forensic and Condition Assessment
Working closely with the architect and contractor in a Design-Build arrangement, we investigated various water intrusion issues in the swimming pool, gymnasium, and auditorium buildings. Steel corrosion, wood deterioration, and masonry cracks were uncovered and assessed to provide a complete condition assessment of the buildings including recommendations and associated costs for repairs including replacement. Ultimately, we were retained to design repairs for the gymnasium and auditorium, and replace the roof and associated framing while preserving the masonry walls of the swimming pool building by using temporary bracing inside the pool building.

Modorum Bridge, Insurance Claim
Assessed damage caused by fallen tree impact on a solid sawn multi-stringer type wood bridge with a timber plank deck. Damage to the railing, deck planks, stringers and bents was documented to develop necessary like kind and quality repairs.

Davis Rothwell Earle Xoxhihua, Litigation Support
Provided technical support for defense team representing contractor of wood framed hotel. Reviewed seismic strengthening designed by opposing counsel's expert and provided cost efficient alternatives.

Davis Rothwell Earle Xoxhihua, Litigation Support
Claims were investigated regarding excessive deflections of steel plate wood trusses in a custom beach-front property. Engaged early in the litigation process, provided litigation support for defense council by investigating the issues and assessing the merits of the claims. Claims were dropped shortly thereafter.

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13th & Olive Student Housing, Litigation Support
Eugene, Oregon
Consultation for mediation associated with 13th and Olive Student Housing in Eugene, Oregon.

26 Manor Drive, Forensics
Piedmont, California
Evaluated existing structural conditions to determine the scope of necessary repairs. Expert consultation regarding structural issues and repair approaches.

401 Sherwood Drive, Forensics
Sausalito, California
Investigated the extent of degradation of sheathing and framing on multiple apartment buildings. Designed and detailed repairs for deteriorated framing and sheathing as needed.

4130 Happy Valley Road, Structural Engineering Litigation Support
Orinda, California
Litigation support and consultation to LeClair Ryan.

Apple Valley Library, Insurance Claim
San Bernardino, California
Provided technical support for settlement of insurance claim related to roof truss damage. Provide value engineering recommendation for shoring of the remaining trusses to substantially reduce the cost of additional shoring. Also, provided detailed scope of repairs including information on specific constraints to repair that affect cost.

Brennan Residence, Litigation Support
Observed conditions of existing roof trusses and provide expert consultation and coordination of findings.

Clay Street Garage, Clay & 14th Street Sidewalks Evaluation
Oakland, California
Evaluated the capacity of the girders and deteriorated slabs at the first floor of the parking structure. Developed repair documents.

County of Napa, Hall of Justice, Structural Engineering Services
Napa, California
Third-party revision of structural repair/retrofit scope of existing building damaged by the West Napa Fault earthquake on August 24, 2014.

Freres Residence Litigation Support
Oakland, California
Evaluated the existing structural conditions and provide expert consultation regarding structural issues and repair approaches for 5 story wood framed custom home.

North Park Apartments, Tenant Improvement, Closets
Burlingame, California
Re-orienting the closets in three separate timber-frame apartments such that the doors to the closet open to the bedroom instead of the hallway. The planned closet openings need to be made in to a load bearing wall.

Structural Evaluation & Design

Department of Veteran Affairs (VA) Vancouver Building 11, Seismic Upgrade
Vancouver, Washington
Designed a seismic upgrade to Immediate Occupancy Performance for an 108,000 square foot medical/office facility. The seismic upgrade included upgrading both the structural system and nonstructural building systems. Detailed analysis was performed to significantly reduce the construction costs of the seismic upgrade. Built in 1990, Building 11 houses inpatient

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and outpatient services including primary care, mental health, short stay, pharmacy, physical therapy, information technology and other services. This medical complex consists of a three-story tower (concrete, steel, wood and masonry), two single-story wings (wood framed) and an entry canopy (steel).

VA Vancouver, Community Living Center (CLC), Seismic Renovation
Vancouver, Washington
Using ASCE-31, performed a Tier 2 detailed seismic analysis of the shear walls in this one-story wood building and developed recommended strengthening options to the VA. Built in 1983, before the effects of the Cascadia Subduction Zone were appropriately incorporated into the building code, this 120-bed CLC, which is categorized as an Essential Facility, is required to achieve Immediate Occupancy Performance.

VA Seattle B101 Mental Health Facility & Parking Garage, New Design
Seattle, Washington
Designed a new 230,000 square foot building with a high-performing buckling restrained braced frame system to promote seismic resiliency. To accommodate the flow of traffic on campus without encroaching on facility space, a portion of the 1,000 car parking structure will be subterranean while the aboveground portion is narrow and tall. The project team worked together to create a phasing plan that successfully delivered these sophisticated facilities and improvements within a constrained site. LEED Gold certification is targeted.

VA Portland Building 100, Roof Expansion Study
Portland, Oregon
Developed both a structural gravity and seismic upgrade scheme to address all structural issues found to be noncompliant with Immediate Occupancy performance objective and the expansion of the roof in three unique locations. Building 100 was constructed in 1988 and is a nine-story with penthouse steel braced frame building that serves as the main hospital. In 2003, using ASCE-31, completed a seismic evaluation of this 685,000 square foot hospital.

VA Portland Building 100, Basement Study
Portland, Oregon
Provided services to help the VA determine if it is feasible to excavate the "pyramids" at the B1 level to increase square footage within the current footprint. The building serves as the facility's main hospital. It is a nine-story structure with a penthouse, with the exterior grade approximately level with the first floor at the east and south sides, sloping down to the lower basement level at the north and west sides.

VA White City Building 218, New design
White City, Oregon
Designed the demolition of a two-story brick building and a replacement domiciliary structure of approximately 19,000 square feet. The design for the new 50-bed domiciliary included a single-story wood framed complex with an ornate two-story link structure. The link structure consisted of combined steel and wood framing and included a large atrium entryway with curved walls. Construction cost was approximately $5.5 million.

VA, Loma Linda Community Based Outpatient Clinics, Design Build
Loma Linda, California
Designed a three-story outpatient clinic with a total of approximately 350,000 square feet. The new building's gravity system consists of concrete over metal deck on steel beams and girders which are in turn supported by steel columns founded on concrete spread footings. The lateral-force resisting system is Special Steel Moment Frames on concrete spread footings, mostly on the perimeter, and concrete floor and roof slabs

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acting as diaphragms. The building is classified as a Mission Critical Facility and is required to be designed for resisting blast and progressive collapse.

VA Palo Alto Ambulatory Care Center & Polytrauma Rehabilitation, New Design
Palo Alto, California
The 325,000 square foot Ambulatory Care Replacement Center will accommodate most Palo Alto Division ambulatory care clinics, many of which are currently located in former inpatient psychiatric buildings originally constructed in 1960. This project consolidates approximately 240,000 ambulatory care encounters and transnational research programs into state of the art facilities. In addition to the Ambulatory Care Replacement Center, this project includes the design of six additional buildings on campus: a 79,100 square-foot Polytrauma Rehabilitation Center housing both inpatient and outpatient treatment programs, a 28,000 square-foot Recreation Services Building, a 90,000 Research Building, a 33,000 square-foot Radiology Addition to the main hospital, and two parking structures creating approximately 3,000 new parking spaces.

Tualatin Valley Fire & Rescue, Station #51 & 52, Peer Review
Various Locations in Oregon
Provided structural engineering/peer review services for the seismic retrofit schemes. This fire station structure consists of an apparatus bay and support structures to the east and west. All three structures are tied together. The facility is a single story structure, covering about 10,000 square feet. The apparatus bay roof structure is taller than the adjacent roof structure. The existing gravity system consists of plywood decking supported by wood trusses, which are, in turn, supported on glue-lam beams or masonry walls. Reinforced masonry walls are founded on concrete wall footings. The lateral force resisting system is presumed, based on the retrofit drawings, as a series of reinforced masonry shear walls.

City of Portland, Fire Station #1, Seismic Upgrade
Portland, Oregon
Performed a seismic evaluation and designed the seismic upgrade of this historic fire station constructed of non-ductile concrete shear wall. Built in 1952, the station is three stories with a full basement, drill tower and apparatus bays that now meet the Immediate Occupancy performance objective. This facility reopened in December of 2009 and currently supports both the main heavy rescue services downtown as well as the BFRES istrative services and responds to over 6,000 emergency calls per year. Construction cost was $9.5 million which was less than half the cost of a new station as originally desired.

Union Station, Phase I & II, Conditions Assessment & Seismic Upgrades
Portland, Oregon
Led a multi-disciplinary A/M/E & Fire team to conduct a complete inventory of the existing building systems for this historic landmark building, perform a detailed building condition assessment and develop a multi-phased architectural repair/restoration and seismic work plan, including historic preservation of exterior stone walls, chimneys, and a clock tower. Have successfully implemented two phases of the overall seismic upgrade to renovate and strengthen roof of Baggage Claim area, Wilf's Restaurant, and the northern end of the Union Station Building.

Confidential, Springfield, ESS Clean Room
Hillsboro, Oregon
Provided calculations and details for structural and non-

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structural engineering design and associated construction administration services for the ESS Lab project.

Confidential, Corvallis Building 2, Design Renovation with Seismic Strengthening
Corvallis, Oregon
As prime consultant, designed the seismic upgrade for this two-story, 450,000 square foot structure to Life Safety Performance. The retrofit was carefully designed to be constructed in the operating facility, including clean room, with no impact to business operations. Previous work on the site included structural and non-structural seismic evaluations.

AAC Hanger, Joint Base Lewis-McChord, Temporary Bracing Washington
Designed the temporary erection bracing per AISC Design Guide 10 for the JBLM FY14 AAC Hanger. Third-party revision of structural repair/retrofit scope of existing building damaged by the West Napa Fault earthquake on August 24, 2014.

Confidential, Post Earthquake Training Program
Hillsboro, Oregon
Developed an earthquake response program consisting of five buildings including Administration, Manufacturing, Central Utility Plant, Warehouse, and Distribution Center. As part of the program, assessed each building's performance given a major seismic event, provided recommendations for strengthening to improve usability after a major event and implemented a post-earthquake response program.

Confidential, Hillsboro, D1C Trestle, SD to CA Services
Hillsboro, Oregon
Provided structural engineering services from schematic design through the services during construction for the seismic strengthening of the D1C Trestle structure located at Ronler Acres in Hillsboro, Oregon.

Confidential, RS4, Seismic Evaluation
Hillsboro, Oregon
Design the conversion of RS4 from existing high-bay warehouse (S occupancy) to office space (B occupancy) and laboratory space (F occupancy) while maintaining the 21,000 square feet of climate controlled storage (S occupancy). RS4 is a rectangular, single story tilt up structure, located to the north of RS5 with a 2-inch seismic joint. The overall plan dimensions of the building are approximately 240 feet in the east-west direction by 550 feet in the north-south direction.

Confidential, Pipe Trestle Analysis, Seismic Evaluation
Oregon
Performed a structural analysis of a critical pipe trestle structure located at a high tech facility. Constructed around 1999, the trestle is roughly 420 feet long and supports two primary levels of pipes. The entire trestle resembles a scaled "multi-span steel truss double-deck bridge," and consists of two similar segments, with steel superstructures separated with an expansion joint in the middle. With construction documents for a seismic retrofit already developed by another engineering firm, the client requested an advanced analysis of the trestle to attempt to reduce the required strengthening that was previously developed. Using advanced analysis, reduced the seismic retrofit scope saving the owner over a million dollars in construction costs while eliminating the construction impacts to business continuity that would have been incurred with previous retrofit design.

Confidential, Seismic Phase 1 Studies
Various Locations
Provided consulting services to improve the seismic resistance

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of clients inventory of existing structures and to better protect the life safety of building occupants and to provide safe egress in the event of a major earthquake.

Oregon State University (OSU), Waldo Hall, Upgrade
Corvallis, Oregon
Seismically evaluated and created a seismic upgrade scheme for the forth floor infrastructure upgrade of historic Waldo Hall located on the OSU campus. Completed a Tier 2 Deficiency Only seismic evaluation of the building's lateral force resisting system for the Life Safety Performance objective using 2/3 of the mapped Maximum Credible Earthquake acceleration response parameters contained in ASCE 41-06. Developed a structural seismic upgrade concept for the building to address all structural issues found to be noncompliant with the life safety performance objective. Helped to develop a detailed scoping document for the structural design services required in all remaining phases of the project.

OSU Sackett Hall First Floor, Phase I & II
Corvallis, Oregon
Design services for floor remediation due to excessive moisture damage. Work included design through construction administration for the concrete floor repair.

Willamette University, Kaneko Commons, New Design
Salem, Oregon
Designed a 151 bed, 65,000 square foot, student residential addition. The addition included student and faculty housing, enlarged dining facility, and meeting spaces. With a total project cost of $16 million, Kaneko Commons received LEED-Gold certification.

Portland State University, Science Research & Teaching Center, New Design & Seismic Upgrade
Portland, Oregon
Using performance based engineering and advanced analysis, designed the seismic upgrade of a multi-storied concrete structure, approximately 250,000 square feet. In order to minimize disruption to the student occupants and symbolize the building's modernization, innovative exterior strengthening schemes were developed and utilized. By pinpointing the exact seismic deficiencies, the upgrade scheme saved $1.4 million in construction costs for this LEED Gold project. In addition to the seismic upgrade of the existing building, this project also included design and construction of a new three-story Hazardous Materials Storage building and pedestrian access ramp. The steel framed structure with reinforced concrete shear walls utilizes ovative sliding seat connections to seismically separate the new and existing buildings.

Brigham Young University, Clyde Building, Structural Evaluation
Provo, Utah
Structural evaluation of Clyde Building, which is a four-story concrete frame structure over a single basement level with significant amounts of CMU infill and partition walls.

University of California (UC), Santa Cruz, Cowell Health Center, Design Renovation with Seismic Strengthening
Santa Cruz, California
Designed the seismic improvements and expansion of the Cowell Student Health Center building. The project involved the seismic strengthening of the one-story North Wing, the two-story Central Wing and the one-story South Wing. Built in the late 1960s, the structures are reinforced concrete founded on concrete caissons.

UC Santa Cruz, Cowell College Dining Hall, Design Renovation with Seismic Strengthening
Santa Cruz, California
Designed seismic corrections for this one-story with basement

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structure, as part of a complete building renovation including new kitchen and dining facilities. It is a cast-in-place reinforced concrete structure with a wood roof, concrete bearing walls, and concrete moment frames as the seismic system.

Washington State University, Compton Union Building, Construction Means & Method Engineering
Pullman, Washington
Designed shoring details for existing concrete retaining walls, demolition of walls, floor beams, joists and columns

The Church of Jesus Christ of Latter-day Saints Church Business College, Triad Center 3 & 4, Seismic Evaluations
Salt Lake City, Utah
Conducted performance based evaluations of five reinforced concrete office buildings for re-adaptive reuse to higher education facilities. Designed renovations for Triad 3 for a five-story and Triad four a ten-story structure built in 1983 to accommodate new uses including classrooms, offices, and library space. A new addition was added to Triad 3 to provide additional classroom spaces. In addition, a pedestrian sky bridge was added to connect Triad 3 to an adjacent parking structure. Degenkolb developed evaluation criteria to meet the requirements of the Basic Safety Objective of FEMA 356. Using linear dynamic and non-linear static pushover analysis, evaluated five existing Triad Center buildings for agreed upon life-safe and collapse prevention performance levels. Detailed seismic evaluations and advanced analysis proved that the existing building could meet the performance objectives where more simplified procedures resulted in significant deficiencies.

The Church of Jesus Christ of Latter-day Saints Church, Conference Center
Salt Lake City, Utah
Performed advanced structural analysis of the Salt Lake City Conference Center to evaluate the buildings performance compared to the Immediate Occupancy Performance Objective. The conference center consists of a large auditorium, theater, and parking structure and occupies an entire city block. The roof structure of the auditorium consists of steel trusses spanning almost 300 feet and supporting a green roof with terraced walkways. In order to define the most accurate seismic hazard at the site, Degenkolb developed site specific ground motions.

The Church of Jesus Christ of Latter-day Saints Church, Administration Building
Salt Lake City, Utah
Designed a Basic Safety seismic upgrade for the five-story steel frame building originally constructed in 1910. The design was detailed in a previous feasibility study and includes bracing of masonry walls and parapets with anchoring to granite veneer.

The Church of Jesus Christ of Latter-day Saints Church, Saint George Temple, Seismic Upgrade
St. George, Utah
As prime consultant, designed the seismic upgrade for this two-story, 450,000 square foot structure to Life Safety Performance. The retrofit was carefully designed to be constructed in the operating facility, including clean room, with no impact to business operations. Previous work on the site included structural and non-structural seismic evaluations.

North Bend Hotel, Seismic Evaluation
North Bend, Oregon
Performed a Probable Maximum Loss (PML) study and designed the seismic retrofit for this 25,600 square foot, 1920's five-story

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wood and reinforced concrete hotel with full basement and partial mezzanine above a portion of the first floor. Identified potential deficiencies in the lateral force resisting system of the building and using ASCE 41-06 designed the seismic upgrade to achieve the desired Life Safety performance objective.

Bonneville Power Administration, Dittmer Control Building
Vancouver, Washington

As prime consultant, performed a seismic evaluation of a 120,000 square foot, two-story, concrete shearwall building and a nearly one hundred foot tall reinforced concrete tower. The subsequent retrofit design increased the structural and non-structural performance to Immediate Occupancy performance level. Due to the critical operations which could not be interrupted by construction, the seismic retrofit was designed to minimize impact to occupants by performing as much work as possible from the outside or on top of the structure.

Yotel, Construction Means & Methods Engineering
San Francisco, California

Construction Means and Methods of nine-story, steel framing in cased in fireproofing concrete with concrete slabs and URM wall infill structure over a single basement, built circa 1903.

Clean Water Services, Rock Creek Solids Building, Seismic Evaluation
Portland, Oregon

Performed a seismic evaluation of the multi-story building with two and three story sections, a partial basement, and plan dimensions of approximately 100 feet by 200 feet.

Stanford Health Care, Lucile Packard Children's Hospital
Palo Alto, California

The 530,000 square foot state of the art Lucille Packard Children's Hospital is currently under construction and planned for opening in 2017. This distinctive six-story building is located directly adjacent to existing hospital facilities of Stanford Health Care. The 150 bed tower includes clinic, diagnostic treatment, and support spaces. The 200,000 square foot parking garage includes 420 spaces in a five-story above grade/three-story below grade structure. The existing hospital has maintained operations while the new Children's Hospital is under construction. In addition to the structural design, Degenkolb has been involved planning the challenging phased make ready work and foundation protection systems for the adjacent buildings approved by OSHPD. Adding to its distinction, some skin elements are the first of their kind to be approved for hospital use in California. Targeting LEED certification, this world-class facility uses sustainable materials and systems as well as creating a healing experience that will establish new standards.

Stanford Health Care, Redwood City Medical Office Buildings, Design Renovation without Seismic Strengthening
Redwood City, California

Schematic design phase including interior and exterior upgrades involving the four existing buildings on the Redwood City campus.

Peacehealth Sacred Heart Medical Center Eugene, Seismic Study
Eugene, Oregon

Provided Tier 1 and Tier 2 structural and nonstructural evaluations. Develop upgrade concepts for each building to meet seismic performance objective.

CPMC Van Ness and Geary, New Design
San Francisco, California

Designed a new 730,000 square foot, 12-story, acute care facility including patient bed floors, diagnostic and treatment centers, and subterranean parking. The $2.1 billion project includes 274

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patient beds. The current structural system is a steel moment resisting frame with supplemental viscous wall dampers to reduce earthquake demands. This will be the first application of wall dampers in the United States. The current structural system is a steel moment resisting frame with supplemental viscous wall dampers to safely absorb earthquake energy and minimize damage to the structural system and the building's contents. This will be the first application of wall dampers in the U.S. By controlling the earthquake-induced displacements using the dampers, the steel frame weight was reduced significantly compared to a conventional steel moment resisting frame. In addition, the dampers reduce seismic accelerations. These savings more than offset the cost of the supplemental dampers, providing better seismic performance for less cost than a conventional system. Additional innovative techniques being used on this project include: displacement testing and analysis, full scale component testing and advanced Building Information Modeling (BIM). With green features, such as living roofs (or "green roofs").

Publications

Conference Proceedings
Lumbard, Devon, Newell, James, Yu, Qi-Song "Kent" , and Malley, James. "Seismic Retrofit of a Higher-Education Building Using Advanced Analysis to Optimize Use of Existing Building Components." Structures Congress, Las Vegas, Nevada, 2011.