

DAVID O. KNUTTUNEN, P.E.

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QUALIFICATIONS

Expertise

Structural Engineering

Analysis and design of structural systems for buildings and other structures, residential and commercial, new work and renovation, including steel, concrete, masonry and timber construction. Computerized structural analysis including dynamic non-linear and stability analyses. Extensive experience with renovations of older New England structures.

Services

- ***Structural Design for Architects and Owners***

New work or renovation; residential, commercial, other; retaining walls; monumental stairs; creative solutions and unusual materials or designs

- ***Structural Design for Contractors***

Contractor's design/build items; corrective work; value engineering; shoring design; equipment supports; design for shop drawings

- ***Investigations and Reports***

Structural peer reviews; due diligence reports; structural home inspections; investigation of structural problems and design of repairs

- ***Expert Witness Testimony***

Analysis and testimony as an Expert in cases involving structural failures or compliance with structural Building Code provisions.

Computing

Advanced structural analysis and finite element analysis software, CAD drafting with AutoCAD Architecture, numerous other special purpose analysis & design programs, some developed in house.

Education

University of California, Berkeley, M.S. in Engineering

Massachusetts Institute of Technology, B.S. in Civil Engineering

EXPERIENCE

Prior Employment

Mr. Knuttunen has been practicing structural engineering for over 40 years, and has been a licensed Professional Engineer since 1985. Prior employers have included LeMessurier Consultants and Weidlinger Associates of Cambridge, MA, and Souza, True and Partners of Watertown, MA.

Building Code

Seismic Advisory Committee

Massachusetts State Board of Building Regulations and Standards

Co-authored building code provisions for seismic design requirements for existing buildings subject to alteration, addition or change of use.

Teaching

Boston Architectural Center

Lecturer, Structural Design, 1985-1987

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TYPICAL PROJECTS

- New Buildings***
- **Tanglewood Concert Hall***, Lenox, MA – World class concert hall in masonry, steel, timber, and concrete with cantilevered balconies and architecturally exposed heavy timber trussed porticos
*as project engineer with a prior employer
 - **Courtyard at Westgate**, Burlington, MA – 28,000 SF, multi-unit residential development, light timber framed, with truss roofs.
- Existing Buildings***
- **Foxboro State Hospital Adaptive Reuse**, Foxboro, MA – “Shell renovation” and structural Code upgrades to convert early 20th Century masonry, concrete, steel and timber hospital buildings for office use.
 - **Fed Corp Office Addition**, Dedham, MA – Two story, 2800 sf office addition, to a heavy equipment garage with a small, existing, mezzanine office. Addition was framed with steel beams and columns plus wood framing. Wind bracing was a combination of wood shear walls and steel diagonal bracing. Foundations were partially spread footings, and partially helical piles due to varying soil conditions on site.
 - **175 Purchase St**, Boston MA – Determining maximum density of filing/storage possible to suit existing floor capacity in a converted, 19th century, heavy timber-and-masonry building in Boston's commercial district.
 - **695 Atlantic Ave**, Boston MA – Several projects, including reinforcing first floor of early 20th century steel-framed building to support a fitness center.
- Repair***
- **Public Library**, Wayland, MA – Emergency repair of failed steel and timber trussed girder valley rafter in an early 20th Century library building, followed by a general reinforcement of the roof framing, after determining by analysis that other existing members were highly overstressed.
 - **Public Library**, Holliston, MA – Temporary shoring and permanent repairs to a large number of low-slope, long-span, metal plate connected light timber roof trusses
 - **Shopping Mall**, Holden, MA – Design of emergency shoring and permanent repair for partially collapsed roof trusses in big-box commercial facility
- Residential***
- **New residences**, Cape Cod & Greater Boston areas – high square footage, luxury homes, usually framed with engineered lumber joists and beams and lumber rafters.
 - **Additions & alterations** – Numerous alterations, such as using beams and posts to eliminate bearing walls, new engineered wood shear walls to enhance building wind resistance, as well as vertical or one- or two-story lateral additions.
 - **Attic conversions** – Conversion of existing residential attics into occupiable third floor, sometimes using a long-span truss or other special

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framing to avoid adding interior columns in the existing 1st floor condominium units.

- **Supported floor garage**, Weston, MA – Residential two-car garage built into a hill, with car-parking on the second, supported level, framed with a concrete slab on engineered lumber joists.
- **Residential decks** – Framing design or structural review of numerous single or multi-story decks, and roof decks, for single or multi-family residences.
- **Silo Conversion**, Groton MA – Structural consulting for the conversion of two old, precast concrete-plank grain silos into art exhibit space.
- **Rooftop solar installations** – Structural investigation and sometimes reinforcement design for installations of roof top solar arrays, ballasted or mechanically fastened on residential, commercial, and institutional buildings.
- **Site Retaining Walls** – Design of site retaining walls in reinforced concrete or masonry for a number of residential and commercial properties.

Other

Structural Reviews

Numerous structural evaluations, peer reviews and due diligence studies, including schools, high rise office buildings and residential structures. Examples include:

- One Technology Drive (low-rise office); Westborough, MA
- 31-33 State Street (high-rise boutique office); Boston, MA
- Copley Marriott Hotel (high-rise hospitality); Boston, MA
- 1100 Mass Ave (low-rise industrial); Boston MA
- Colonial Plaza (shopping mall); Waterbury, CT
- Various single family homes in the Greater Boston area.

Expert Witness

- Testimony on behalf of owner in suit against contractor re. faulty roof framing and other repairs to timber barn.
- Consultation with attorneys on behalf of injured worker in suit against homeowner re. collapse of a deteriorated multi-story wooden deck.

Selected Publications

“New Code Provisions for Existing Buildings in Massachusetts”, *Fifth National Conference on Earthquake Engineering*, July 1994

“Electronic Spreadsheets in Structural Design”, *Eighth Conference on Computing in Civil Engineering*, June 1992

“Beam Supported Slabs Subject to Edge Loading”, *ASCE Structures Congress*, May 1989

“The Role of Ductility in Seismic Design”, *Civil Engineering Practice*, Spring 1987