

# **REQUEST FOR QUALIFICATIONS**

## **Seismic Advisory Board Member**

### **Position Description #8: Tunnels**

#### **GENERAL DESCRIPTION**

The Seismic Advisory Board was created as a recommendation of the Governor's Board of Inquiry following the 1989 Loma Prieta Earthquake. The California Department of Transportation (Caltrans) established the Caltrans Seismic Advisory Board (Board) to provide advice on seismic safety policy as it applies to the design of transportation structures in California. The Board consists of a maximum of eight members appointed by the Director of Caltrans (Director) to assure balanced representation among pre-eminent scientists, engineers, researchers and policy experts assembled from both the private and public sector. In 2016 Caltrans agreed to expand the expertise of the Board to review seismic design guidance for the California High Speed Rail Authority (CHSRA). The expertise of the Board shall reflect the full breadth of Caltrans' and CHSRA's responsibilities for the seismic safety of transportation structures and that expertise can be adjusted to meet their needs.

Incumbent shall serve as a subject matter expert to both the Board, Caltrans and CHSRA. Area of expertise shall be in the planning, design, construction and / or retrofit of both bored and cut and cover tunnels. It is also expected the individual will have experience drafting design guidance and policy at either the state or national level.

#### **MAJOR DUTIES & RESPONSIBILITIES**

Major duties and responsibilities include one or more of the following:

- Advise the Caltrans Director, Chief Engineer, State Bridge Engineer, CHSRA CEO, and Director of Engineering on the items described below, as well as other matters upon request.
  - Review of earthquake engineering and seismic design as practiced by Caltrans and CHSRA.
  - Formulate recommendations for improvements in Caltrans and CHSRA earthquake engineering and seismic design practices.
  - Review of seismic policy, hazard definition, and mitigation directives.
  - Review of seismic design guidelines and standards for transportation structures.
  - Review and comment on priorities for the Caltrans and CHSRA seismic research programs.
  - On request, provide the general public with explanations regarding Caltrans and CHSRA seismic safety policies and procedures for maintaining safety and functionality of California's transportation structures.

- Recommend investigations or new initiatives to learn from the performance of transportation structures from major earthquakes worldwide.
- Conduct duties under the Board charter impartially, without restriction or limitation, and in a manner the Board member believes is necessary to fulfill the purpose and goals of the Board.

## **SPECIFIC DUTIES & RESPONSIBILITIES**

Specific duties and responsibilities include one or more of the following:

- Advise Caltrans and CHSRA on
  - new techniques under development for evaluating ground movement patterns and stability for varying excavation, tunneling, micro-tunneling, and mining conditions
  - design and retrofit, to include performance-based engineering and design approaches, as well as construction of tunnels, cross-passages, ventilation shafts and portals under the specified seismic design event
  - maintenance and operation of tunnels, particular with respect to fire life safety codes such as NFPA
  - developing analytical methods and siting strategies to mitigate damage to underground train stations, tunnels, cross passages, ventilation shafts and portals during earthquakes
  - construction methods for boring tunnels through fault crossings, including hard and/or fractured rock and soft ground conditions
  - fault crossing design and post-fault rupture mitigation strategies for tunnel excavation and lining construction methods, to compensate for any tunnel offset from a seismic event

## **QUALIFICATIONS**

In addition to an advanced degree(s) in engineering and a substantial publication record, the candidate should have at least ten (10) years of experience in one or more of the following:

- Developing techniques for evaluating ground movement patterns and stability for a variety of excavation, tunneling, micro-tunneling, and mining conditions.
- At least five of those years should demonstrate progressive experience in the design, analysis or construction, to include performance-based engineering and design, in seismic zones of tunnels, cross-passages, ventilation shafts and portals. Experience may be from either the private sector or at the federal or state level in the public sector.
- Knowledge of the AREMA, AASHTO Bridge Design Specifications and FHWA Tunnel Design Guidelines and Specifications.
- Developing analytical methods and siting strategies to mitigate damage to tunnels and portals during earthquakes.

- Experience in design-bid-build and alternative delivery methods including design-build, CMGC etc. for delivery of transportation project delivery methods.
- Geotechnical engineering and investigations, rock mechanics, design, analysis, construction support for tunnels in hard and/or fractured rock and soft ground conditions, tunnel excavation and lining construction methods, and investigation of geotechnical conditions for tunneling and deep rock tunnels.
- Design and evaluation of the nonlinear dynamic behavior of tunnels under earthquakes and other extreme events.

Recognized technical leadership in the design and construction of tunnels as demonstrated by leadership positions on technical committees, trade associations, public transportation agencies or membership in the National Academies.

#### **BOARD MEMBERS MUST:**

- Be eligible for employment in the US.
- Sign the Board Charter provided at the first Board Meeting. A review copy will be provided prior to finalizing appointment.
- Submit a conflict of interest disclosure form that identifies real or perceived conflicts between the candidate and their duties as defined by their position description. That form (Form 700) will be provided as part of the hiring process ([www.fppc.ca.gov](http://www.fppc.ca.gov)).

The Board operates in a manner that seeks consensus among the members. In cases where consensus cannot be reached, the Board may present multiple recommendations with supportive arguments for each position.

#### **TO APPLY:**

Qualified individuals should submit a Statement of Qualifications (SOQ) that includes a letter of interest and Curriculum Vitae (CV) or resume. The letter of interest should highlight career accomplishments and honors that qualify the applicant for a Board position. The letter must disclose any current or past affiliations with Caltrans or the California High Speed Rail Authority that may be perceived as potential conflicts of interest. The CV or resume must include all academic and professional experience, list of publications, and areas of technical expertise. The SOQ must be submitted in pdf format.

Questions about this RFQ and SOQ submissions should be addressed to:

Charles Sikorsky, Ph.D., P.E.  
Institute of Transportation Studies  
[sikorsky@berkeley.edu](mailto:sikorsky@berkeley.edu)

Applicants are encouraged to submit their SOQ by June 15, 2020. Positions will remain open until filled.

This Request for Qualifications was posted on May 11, 2020  
at [www.techtransfer.berkeley.edu/join-our-team](http://www.techtransfer.berkeley.edu/join-our-team)