



20-16 SEISMIC SAFETY PEER REVIEW

Introduction

Seismic Safety Peer Review is an independent review and assessment of bridges or other structures to meet project seismic performance goals.

Seismic Safety Peer Review scope:

Shall include a review and assessment of the following:

- Project Specific Seismic Design Criteria
- Project Specific Seismic Hazard

Should include a review and assessment of any or all of the following:

- Analytical methodology
- Independent Quality Assurance
- Design details
- Retrofit strategy (when applicable)
- Other items as defined by Caltrans

Caltrans Seismic Safety Peer Reviews are intended to provide value to the project by:

- Assisting Structure Project Engineers in addressing complex technical issues.
- Providing a broad engineering decision-making process.
- Providing project cost saving alternatives, methods, and criteria to avoid an increased factor of safety for unknowns.
- Providing input on structure design criteria and its effects on the project.
- Providing advice on analytical methodology.
- Demonstrating to stakeholders that seismic design methods are appropriate for the project and are consistent with the current state of the practice.



Seismic Safety Peer Review should be considered for the following:

- Important bridges.¹
- Projects requiring exceptions from current Caltrans seismic design standards including Caltrans Seismic Design Criteria and Caltrans Bridge Design Manuals.
- Enhanced Performance level (above Ordinary Standard bridge performance criteria)
- Non-standard bridge types.¹
- Projects where it is determined there is a public need for independent review.
- Projects where it is required by Permitting Agencies.

Seismic Safety Peer Review Types

There are two primary types of Seismic Safety Peer Reviews, either Caltrans or external. A third type, which is a Combined Seismic Safety Peer Review, consisting of both Caltrans and external members, may be approved on an exceptional basis.

Not all Caltrans projects with potential structure seismic design exceptions will require a multi-member panel for Seismic Safety Peer Review. For structure projects with minor, stand-alone seismic design exceptions, Seismic Safety Peer Reviews can be accomplished with qualified individual Peer Reviewers. For more complex structure projects with major seismic design exceptions and issues, a multi-member Seismic Safety Peer Review Panel may be required.

Caltrans Seismic Safety Peer Review

- Caltrans Seismic Safety Peer Review, consisting of Caltrans staff, should be used for Non-standard bridge types, enhanced performance requirements, or exceptions from Caltrans seismic design standards for projects where the seismic technical expertise is available within Caltrans.
- Caltrans Seismic Safety Peer Review members shall be technical experts with the experience and expertise to address the issues to be assessed and may include Technical Specialists, Technical Committee Chairs, or other engineering professionals.
- Project Delivery Team (PDT) members shall not be a Seismic Safety Peer Reviewer or Panel member.

¹These terms are defined in *Memo to Designers 20-1*



External Seismic Safety Peer Review

- External Seismic Safety Peer Review, consisting of members external to Caltrans, should be used for:
 - Important Bridges.
 - Non-standard bridge types, enhanced performance requirements, or exceptions from Caltrans seismic design standards for projects where the seismic technical expertise is not available within Caltrans.
 - Projects where there is a determination of a public need for external peer review.
 - Projects where it is required by Permitting Agencies.
- External Seismic Safety Peer Reviewers shall include technical experts with the experience, expertise and stature to address the issues to be assessed.
- Members of consulting firms and Agencies outside of Caltrans that are associated with the PDT shall not be a Seismic Safety Peer Reviewer or Panel Member.

Decision to Perform a Seismic Safety Peer Review

- The Project Delivery Team (PDT) should address Seismic Safety Peer Review needs in the project programming document during the PSR or PA&ED phase to ensure proper scoping, funding and scheduling of the project. The decision to perform a Seismic Safety Peer Review should be assessed during the development of Advanced Planning Studies and confirmed at or prior to the Type Selection or Strategy Meeting(s).
- The Caltrans Division of Engineering Services (DES) Project Delivery lead Office Chief shall recommend the following:
 - Need for a Seismic Safety Peer Review.
 - Scope of the Seismic Safety Peer Review.
 - Type of Seismic Safety Peer Review appropriate for the project.
 - Names of potential Seismic Safety Peer Reviewers or Panel members for Caltrans Executive Earthquake Committee concurrence and State Bridge Engineer approval.



General Outline of the Seismic Safety Peer Review Process

- The Seismic Safety Peer Reviewer or Panel advises the PDT on their assessment of the seismic design criteria, seismic hazard, and other issues as required to meet the seismic performance goals for bridges or other structures.
- The PDT shall evaluate how the Seismic Safety Peer Review recommendations could potentially be incorporated into the project, and their project impacts. The PDT shall prepare project documentation regarding implementation of Seismic Safety Peer Review recommendations and present them to the Seismic Safety Peer Reviewer or Panel for concurrence.
- If concurrence can not be reached between the PDT and the Seismic Safety Peer Reviewer or Panel, final resolution shall be made through the Executive Earthquake Committee and approved by the State Bridge Engineer.
- Final project specific Seismic Design Criteria developed under the auspices of a Seismic Safety Peer Review Panel shall be forwarded to the Office of Earthquake Engineering for archiving.

Notes:

1. The scope of this document pertains to projects on the State Highway System (SHS). For projects off the SHS, funded with federal or state funds, the Office of Structure Local Assistance will coordinate with the District Local Assistance Engineer to address Seismic Safety Peer Review requirements.
2. For Special Funded Projects, the PDT generally includes Caltrans and the Local Agency and may include other involved Agencies outside of Caltrans.
3. Members of Caltrans DES Executive Earthquake Committee shall not be part of the Seismic Safety Peer Review Panel.

(original signed by Kevin Thompson)

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