



# Seismic Detailing of Single Span Bridges to AASHTO Standards for the State of Nevada, USA.

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## Abstract

The aim of this paper is to provide an overview of seismic detailing to the Nevada Department of Transportation (NDOT) Structures Manual and American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Standards for single span bridges located in the state of Nevada, US, with reference to Project Neon and the I15-CC215 Interchange Project. In general, detailed seismic analysis is not required for single-span bridges regardless of the seismic zone. However, the connections between the bridge superstructure and the substructure shall be designed for the minimum force requirements as recommended by AASHTO. Also, the minimum support length requirements in accordance with AASHTO shall be satisfied at each substructure. Concrete shear keys or cheek walls are, therefore, provided on the abutments to resist the lateral seismic forces, whereas dowel bars are provided to resist longitudinal seismic forces at pinned abutments. The substructure elements are detailed with transverse confinement reinforcement at plastic hinge locations as recommended by NDOT and AASHTO.

**Keywords:** Seismic detailing, single span bridges, AASHTO, NDOT Structures Manual, shear key, plastic hinge.

## 1 Introduction

The aim of this paper is to provide an overview of seismic detailing in accordance with American Association for State Highway and Transportation Officials (AASHTO) LRFD, AASHTO Guide Specifications for LRFD Seismic Bridge Design and Nevada Department of Transportation (NDOT) Structures Manual for single span bridges located in the state of Nevada, US with reference to the following projects: Project Neon and the I15-CC215 Interchange.

## 2 Codal Recommendations

In general, detailed seismic analysis is not required for single-span bridges regardless of the seismic zone. However, the connections between the bridge superstructure and the substructure shall be

designed for the minimum force requirements as recommended by AASHTO.

### 2.1 AASHTO LRFD Recommendations

Single-span bridges do not require any seismic analysis, regardless of seismic zone, in accordance with Article 4.7.4.2 of AASHTO [1]. However, it prescribes the following:

- A seismic force equal to the products of site coefficient ( $S$ ), acceleration coefficient ( $A_s$ ) and tributary permanent load, for the design of superstructure supporting elements.
- Minimum support length requirements shall be satisfied at each abutment as specified in Article 4.7.4.4 of AASHTO.