SECTION 15: DESIGN OF SOUND BARRIERS

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15.1 SCOPE

This section contains guidelines to supplement provisions of Section 15 of the AASHTO LRFD Bridge Design Specifications for the design of sound barriers.

15.4 GENERAL FEATURES

15.4.1.1 General

Sound barriers on bridges shall be lightweight post and panel construction. Each panel shall have an integral passive restraint system.

Roadway sound barriers shall be either cast-in-place concrete or masonry construction. New sound barriers that connect into existing sound barriers or overlap existing sound barriers shall match the existing sound barrier type.

Alternate material or post and panel sound barrier systems on state highway systems shall be approved by Bridge Group during project development.

Rustication shall be considered per the Arizona State Highway System Standard

Aesthetics-Roadside Development Landscape Architecture Guidelines. The maximum allowable rustication for concrete sound barrier walls shall be 2 inches. The rustication shall be ignored for calculation of composite section properties, but shall be included in the dead load on the barrier.

Any backfill placed over a sound barrier footing and next to the wall needs to be compacted to a minimum 100% of ASTM D698 maximum dry density.

15.4.2 Drainage

A special wall design may be required to pass off-site drainage through sound barrier openings.

15.4.3 Emergency Responders and Maintenance Access

Coordinate with the fire departments in the Local Jurisdictions for specific locations and cover type if emergency responders and maintenance access are required.

15.8 LOADS

15.8.1 General

For sound barriers on bridges, posts, brackets, embedment plates, studs, and bridge decks shall be designed for a future wall height extension of 4 feet.

Sound barriers located on bridges shall be designed to prevent catastrophic failure due to vehicular collision forces and shall limit the risk of falling debris resulting from vehicle impact. Restraint systems for preventing components from falling on the roadway below shall be utilized on lightweight panel soundwalls.

Sound barriers shall not be supported on top of the barrier for any condition. Sound barriers shall be placed behind the barrier. See Section 13 of these guidelines for barrier requirements.

For sound barriers along roadways, refer to SD 8: Sound Barrier Walls series. For special design sound barriers, the sound barriers shall be designed for a future wall height extension of 4 feet.

15.8.2 Wind Load

Sound barriers shall be designed to the Strength Limit State (Strength III). Sound barriers on bridges shall be designed assuming a Wind Exposure Category C.

15.8.4 Vehicular Collision Forces

Vehicular collision forces shall be considered where the sound barrier wall is adjacent to traffic hazards, private property, or travelways to prevent catastrophic failure due to vehicular collision forces and shall limit the risk of falling debris resulting from vehicle impact.