



4.3 SOUND WALL DEAD LOAD DISTRIBUTION

4.3.1 GENERAL

This policy addresses the distribution of sound wall dead loads to the primary load-bearing longitudinal structural members of bridges.

4.3.2 POLICY

Mathematical models shall quantify the transverse distribution of sound wall dead loads. The sound wall dead load shall be applied as an eccentric load at the service and strength limit states. In a refined (3D) model, the sound wall stiffness shall not be included, and the sound wall dead load shall be applied as external load.

In a spine beam analysis, sound wall dead load shall be distributed in accordance with Sections 4.3.3 and 4.3.4. Additionally,

- The shear demand induced by sound wall dead load need not include shear correction factors for skew.
- The eccentric dead load of the barrier and sidewalk supporting the sound wall shall be distributed using the method used for the sound wall dead load.
- If load distribution is evaluated using refined methods, a table of dead load distribution factors shall be shown in the General Notes of the contract plans.

4.3.3 CONCRETE BOX GIRDER BRIDGES

4.3.3.1 Shear

- The shear demand in the exterior girder closest to the sound wall shall include 100% of the sound wall dead load.
- The shear demand in the first-interior girder closest to the sound wall shall be based on an equal distribution of sound wall dead load to each girder in the cross section.
- The shear demand in the remaining girders need not include sound wall dead load.



4.3.3.2 Flexure

- The flexural demand in each girder (except the exterior and first interior girders closest to the sound wall) shall be based on an equal distribution of sound wall dead load to all girders in the cross section.
- The flexural demand in the exterior girder closest to the sound wall shall include 25% of the sound wall dead load, in addition to the demand based on an equal distribution.
- The flexural demand in the first interior girder closest to the sound wall shall include 25% of the sound wall dead load, in addition to the demand based on an equal distribution.

4.3.4 BEAM-SLAB BRIDGES

- The shear and flexural demand in the exterior girder closest to the sound wall shall include 75% of the sound wall dead load.
- The shear and flexural demand in the first-interior girder closest to the sound wall shall include 25% of the sound wall dead load.
- The shear and flexural demand in the remaining girders need not include sound wall dead load.

4.3.5 REFERENCES

1. AASHTO. (2017). *AASHTO LRFD Bridge Design Specifications*, 8th Edition, American Association of State Highway and Transportation Officials, Washington DC.
2. Caltrans. (2019). *California Amendments to AASHTO LRFD Bridge Design Specifications*, 8th Edition, California Department of Transportation, Sacramento, CA.