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Precast Noise Walls – A “Sound” Alternative

By Ronald Thornton, PE

Oh! the sweet sounds of the highway. Tires squealing, gears jamming, eighteen-wheelers roaring at 70 miles per hour. This may not seem very melodic to residents living near a major thoroughfare but it can be music to the ears of a precaster making noise wall products. Noise abatement has become a major issue for state and local authorities, particularly in high growth areas where housing developments are being built in close proximity to busy highways. FHWA requires the completion of a noise impact study in order to obtain funds under the Federal aid system for highway projects. Based on the results of this study, noise abatement measures must be incorporated into the project. Such measures must be deemed practical, reasonable and acceptable to the public.

There are several strategies for mitigating highway noise including:

- Physical separation or buffer zones. These require a great deal of undeveloped space between the highway and residential areas. The actual distance may be reduced when trees and other vegetation are present to absorb some of the noise. Unfortunately in many areas this extra real estate is just too precious to give up.
- Commercial buildings are less sensitive to noise and can act as a buffer between highways and residential zones.
- Earth berms create a natural and effective sound barrier and can be quite attractive with the right landscaping. However, an earth berm can take up a lot of usable land and, in many cases, a large amount of imported fill.
- Vertical noise walls can be constructed of wood, stucco, masonry, metal, and precast concrete. Precast noise walls provide the most efficient

use of available land and, with the right finish, can be visually pleasing and blend in nicely with their surroundings.

The intent of this article is to focus on some of the physical and structural considerations in the design of precast noise wall components including specifications, loads, components, foundations, finishes and other attributes.

AASHTO published its “Guide Specification for Structural Design of Sound Barriers” in 1989. This standard is recognized by most transportation departments although many jurisdictions have requirements that either supplement or modify it in some form or another. State and local codes must be investigated prior to the design of any noise wall to assure that the appropriate specifications are used.

The layout and geometry of a noise wall is based on a number of factors that are included in the noise impact study. These factors include horizontal alignment, right-of-way limits, finished grade profile, acoustic profile and aesthetics.

Once the type of wall and geometry are established then the structural components can be designed. The primary components of a precast sound wall system include posts, panels and foundations. Service loads typically consist of wind or seismic, whichever controls. Soil loads may be present if there is any earth retainage on one side of the wall. Traffic barriers should be installed as needed to protect the noise wall from vehicular impact loads.

To be continued in our next issue....

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Featured Project

Small Culvert Crossing near Reading, PA

Owner: Private

Produced by: Keystone Concrete Products, New Holland, Pa
Specialty Design and Reinforcing Drawings- Delta Engineers



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This little guy is a 5' x 3' precast culvert for a stream crossing on a private access road. The end walls were cast as flat plates and post-tensioned through the entire 24' run.