



LEED Reference Guide **For Precast Concrete Products** **SOUND WALLS**



NPCA

Precast ... The Concrete Solution

SOUND WALLS



With growing traffic and expanding communities, road noise has become a real irritant for communities living along the nation’s highways.

Precast concrete sound walls can be designed to blend in with a city’s architecture and local topography, or even to capture a community’s theme or identity. Reflective sound walls can reduce the perceived noise by as much as half, while absorptive treatments have been found to further reduce noise pollution. And with color additives or stains and textured form liners, the options are nearly endless.

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The Credit Requirements listed in this document are contained within the Leadership in Energy and Environmental Design Green Building Rating System developed by the United States Green Building Council. For more information on the LEED Green Building Rating System, please visit www.usgbc.org.

For additional information about using precast concrete within the LEED system, please visit www.precast.org

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Rough and Tough

The strength of precast concrete gradually increases over time. Other materials can deteriorate, experience creep and stress relaxation, lose strength, deflect over time and may not be able to withstand vehicular impacts. The load-carrying capacity of precast concrete is derived from its own structural qualities and does not rely on the strength or quality of the surrounding backfill materials. Studies have shown that precast concrete products can provide a service life in excess of 100 years. In severe conditions, additional design options are available to extend the life of concrete products.

We're Talking Quality Here

Because precast concrete products typically are made in a controlled plant environment, they exhibit high quality and uniformity. Problems affecting quality typically found on a job site- temperature, curing conditions, poor craftsmanship and material quality are nearly eliminated in a plant environment.

Installation is Easy

Setting precast concrete structures into place is easier because they do not require special rigging (such as fabric slings) to avoid structural damage. Other materials such as fiberglass can suffer structural damage during compaction.

Ready for Anything

While no material is completely immune to chemical attack, the mix designs used to produce precast concrete can be adjusted to help withstand anticipated corrosive agents. Materials such as steel and other materials quickly deteriorate in the presence of corrosive agents, some in the presence of water alone. To better protect reinforcement from corrosion, the precast concrete strength should be designed to 4,000 psi or more.

Keep it Quiet

Reflective precast concrete barriers reduce the sound level by either absorbing the straight-line path of noise from the source, reflecting the noise or a combination of both. The perceived noise does not disappear, but it is significantly reduced due to the increased distance the noise must travel. Using modeling software,

engineers can determine the optimum height and length of precast concrete sound walls to effectively minimize noise levels. Noise can typically be reduced by 5-10 decibels, which is often perceived as reducing the loudness by as much as half. Absorptive surface treatments are also available which have been found to improve the noise reduction capabilities of the system.

Aesthetically Pleasing

The aesthetic options for precast concrete noise barriers are virtually limitless. Concrete may be colored by using integral color pigments or by staining after the casting process. Textures can be created easily on the traffic side and/or the residential side of the posts and panels. Many community planning groups utilize the versatility of precast concrete to capture and preserve a community theme or identity within the precast concrete noise barrier.

No Comparison

Research has shown that concrete provides the highest sound transmission loss value when compared with common noise wall materials. In addition, precast concrete noise barriers require a considerably smaller footprint compared with earth berms, which can make only a barely perceptible decrease in the noise.

Looks Good in "Green"

Besides water, concrete is the most used material on earth. It is nontoxic and environmentally safe. Precast concrete is additionally beneficial because it is made from natural materials. Precast concrete products are used throughout the world as part of sound wall systems of nearly every modern city.

Precast concrete is the choice material for products used in sound wall systems. Precast structures are modular, can fit any design situation, are produced in a quality-controlled environment and are ready to install immediately upon arrival at the job site. Precast sound wall components are easily produced to be durable during storage and transportation, easy to install, less vulnerable than competing products to damage, and are environmentally safe during operation.

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SS 7 Sustainable Sites

Minimize Site
Disturbance in Design
and Construction

Credit Requirement

Max. Points: 2

Minimized Site Disturbance in Design and Construction

Option 1: Development Footprint on Previously Developed Land:

Locate 100% of the development footprint on areas previously developed, or

Option 2: Undeveloped Portion of Project Left Undisturbed

Limit disturbance to:

- 40 feet beyond the building perimeter
- 10 feet beyond surface walkways, patios, surface parking and utilities less than 12 inches in diameter
- 15 feet beyond street curbs and main utility branch trenches
- 25 feet beyond constructed areas with permeable surfaces that require additional staging areas to limit compaction in the constructed zone.

Note: This is a condensed version of the credit. The full credit may be downloaded from USGBC's Neighborhood Development Guide.

Precast Contribution

Precast concrete products are plant cast and delivered to the site ready to set so they reduce the staging area required which can reduce the overall site disturbance.

The impact on the construction site is also reduced because there is no additional formwork, which often requires more construction area for above-ground products and larger excavation areas for underground products.

Less impact on sites can reduce construction waste, shorten the construction schedule and require fewer laborers on-site.



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SS 15
Sustainable Sites

Recycled Content
in Infrastructure

Credit Requirement

Max. Points: 1

Recycled Content in Infrastructure

Use materials for new infrastructure such that the sum of postconsumer recycled content, in-place reclaimed materials and one-half of the preconsumer recycled content constitutes at least 50% of the total mass of infrastructure materials.

Count materials in all of the following infrastructure items as applicable to the project:

- Roadways, parking lots, sidewalks, unit paving, and curbs
- Water retention tanks and vaults
- Base and subbase materials for the above
- Stormwater, sanitary sewer, energy distribution, and water piping

See the NPCA LEED Calculator at www.precast.org/leed for help with this credit.

See the LEED Canada guide for information on Canada's credit requirements.

Precast Contribution

Precast concrete products may contain supplementary cementitious materials such as fly ash and blast furnace slag which will add to the project's recycled content goals.

Precast products may also contain rebar and welded wire mesh which contains recycled steel. Other less frequently used recycled content components include various fiber reinforcements, glass aggregates, silica fume, and recycled crushed concrete.

Beyond precast products themselves, recycled crushed concrete can also contribute to this credit when utilized as road fill base.