

Case Study

Monon Greenway and University of Pennsylvania Bridge use Innovative ‘Green’ Transparent Sheet to Crossover into the New Millennium

Construction in the 21st century requires a balance of functional standards, aesthetic appeal, affordability and environmental awareness. If a bridge design is meant to be considered safe, attractive, cost-effective and “green,” measures need to be taken at the fundamental stages, namely material selection. It is here that PARAGLAS SOUNDSTOP® noise barrier sheet is helping change the way bridges are designed in the new millennium.

Pedestrian bridges and sound walls are critical elements of highway safety. Their design in the past has been a “spare no expense, but go with what works” mentality that has produced functionally-effective, though not environmentally-conscious constructions. Typical materials include concrete, metal and glass—each having its strengths and weaknesses. However, today’s “green” factor is forcing architects to re-think their designs. In order to satisfy this new requirement, are the old materials good enough, or is there room for improvement?

Many designers believe there is and have started using high-quality alternatives such as PARAGLAS SOUNDSTOP. These materials provide increased durability, maintainability and visual impact, while addressing environmental considerations. Two prime examples are the Monon Greenway in Carmel, Indiana, and a pedestrian bridge on the campus of the University of Pennsylvania.

The Monon Greenway

The Monon Greenway is a pedestrian pathway in the heart of Carmel that both protects natural scenery and provides recreation. City officials approved the construction of a bridge that would separate the greenway from a busy street. The bridge needed to maintain the vision of Carmel’s arts district while providing superior safety and aesthetic appeal for pedestrians on the greenway. United Consulting was the design firm hired by the city to meet these requirements.

“The Monon Greenway over Carmel Drive was meant to act as a gateway structure into the city of Carmel,” said Darryl Wineinger, United Consulting project team leader for the Monon Greenway. “The walls on the bridge had to meet strict requirements. The mayor, Jim Brainard,

did not want any protection to take away from the aesthetics of the project. Choosing the best material for the job was an overriding concern for us, and we knew we needed a clear panel solution.”

The material United Consulting selected was PARAGLAS SOUNDSTOP® noise barrier sheet, an ultra-light, strong, transparent product that is manufactured by Evonik Cyro, LLC and supplied by Durisol USA, a division of Armtec Ltd. Partnership. Furthermore, the mayor of Carmel wanted the clarity of the material to last over the years and resist yellowing. PARAGLAS SOUNDSTOP sheet is highly resistant to weathering from UV exposure and it retains its superior light transmission for decades in the outdoors.

Already being used as sound walls on other projects nationwide—such as on the Marquette Interchange in Milwaukee and on the newly-redesigned Woodrow Wilson Bridge near Washington, DC—PARAGLAS SOUNDSTOP had a strong reputation as a more-than-competent sound barrier. Satisfying the Federal Highway Administration (FHWA) and American Association of State Highway and Transportation Officials (AASHTO) guidelines for the design and construction of noise barriers, the sheet has been in use successfully for three decades. Coming in three different thicknesses of 15 mm, 20 mm and 25 mm, the sheets offer tested sound reductions of 30 dB, 32 dB and 33 dB, respectively.

“The panels were intended to be a barrier between the pedestrians on the walkway and the vehicles below the walkway,” continued Wineinger. “We were confident that because the sheet was intended for use on highway projects as a sound barrier that it was going to perform well in this capacity.”

University of Pennsylvania Bridge

When the University of Pennsylvania needed to build a new pedestrian bridge connecting the main UPenn campus with the eastern playing fields— the original access was being blocked by the demolition and reconstruction of the South Street Bridge by the city of Philadelphia—the new bridge had to span over an Amtrak railroad and its accompanying power lines. In this situation, there was a safety concern for pedestrians. Protecting the power lines was another consideration.

“In the original design, the intent was to provide clear shielding for the Amtrak power lines using tempered glass, but Amtrak objected due to new tools available that could break the glass,” said Joel Stahmer of Ammann & Whitney, lead designer of the UPenn project. “Ordinary plastic products were unable to provide a repairable, long-term graffiti resistant surface. We learned about PARAGLAS SOUNDSTOP and decided it was the best material for the job.”

The bridge sound walls were designed to have steel frames that crisscrossed housing opaque tan sections on the lower half and unframed clear sections on top. The concept was to give pedestrians a sense of security without detracting from their view. But, the clear sections needed to be strong enough to deter vandals and require little maintenance.

PARAGLAS SOUNDSTOP noise barrier sheets allow at least 90% of light through and are durable, evident by their tensile strength rating of 70 MPa and flexural strength of 98 Mpa. The noise barrier sheets had all the right characteristics on paper, but how would they deliver in the field?

“The material’s weight and strength made it simple to place and alter in the field to meet certain field conditions. When all was said and done the product worked perfectly for our application and the staff certainly met our expectations” said Eric Lorenzon, co-owner of Lorenzon Brothers, the construction team who installed the panels.

“The PARAGLAS SOUNDSTOP allowed us to achieve a very good realization of the design goals,” added Stahmer. “The material and the support from Evonik Cyro’s engineers allowed us to meet strict requirements on a truly unique design.”

Company Information

Evonik Cyro LLC is an Evonik Degussa Corporation group company headquartered in Parsippany, NJ. Evonik Industries is the creative industrial group from Germany which operates in three business areas: Chemicals, Energy and Real Estate. Evonik is a global leader in specialty chemicals, an expert in power generation from hard coal and renewable energies, and one of the largest private residential real estate companies in Germany. Our strengths are creativity, specialization, continuous self-renewal, and reliability. Evonik is active in over 100 countries around the world. In its fiscal year 2008 about 41,000 employees generated sales of about Euro 15.9 billion and an operating profit (EBITDA) of more than Euro 2.2 billion.

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Editor's Note:

PARAGLAS SOUNDSTOP is all caps.