

CASE STUDY

Express Roadway PR-18

San Juan, Puerto Rico

HISTORY

Expreso Las Américas, or Express Roadway PR-18 as it's more commonly known in Puerto Rico, was built in the 1960s. The highway is 3.78 miles long and runs from San Juan to Río Piedras, where it intersects with PR-1.

PROBLEM

The old highway needed to be widened to keep up with the demand from traffic in a growing population. The area surrounding the highway was a previously cut, landscaped slope, and the Puerto Rico Department of Transportation (PRDOT) wanted to save as many of the trees as possible.

SOLUTION

Anderson Vasquez, of Behar Ybarra & Associates, is a design engineer with over 30 years of experience, particularly in the infrastructure arena. Mr. Vasquez is always looking for new ways to make construction projects easier and more practical.

Mr. Vasquez designed a unique soldier pile wall as a retaining wall in the widening of Express Roadway, PR-18. Instead of wood or concrete lagging, Mr. Vasquez selected horizontal cold formed sheet piles to use between the steel piles. Nucor Skyline produced both the HP 14x89 piles and the cold formed SKS 11, SKS 14, and SKS 16 sheet piles that were used for the soldier pile wall.

The H-piles were inserted to design depth into pre-drilled holes and backfilled with concrete, taking the earth's lateral loads into consideration as a cantilever element. The coated SKS sheets were then installed horizontally, not only for a pleasing aesthetic, but to save time and money over concrete panels.



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Another advantage of using the cold formed SKS sheets is the weight advantage over concrete panels. Using concrete panels would have increased the weight of the wall 6 to 10 times over the use of the SKS sheet pile.

The partially buried row of SKS sheet piles was fully coated with coal tar epoxy to extend their life by 15 years and comply with the PRDOT's 75-year lifespan code. A drainage system was also installed in the cut behind the wall to minimize hydrostatic pressures in the soil.

PROJECT PARTNERS

Owner

Puerto Rico Department of Transportation – San Juan, PR

General Contractor

Las Piedras Construction Corporation – Las Piedras, PR

Engineer

Behar Ybarra & Associates – San Juan, PR

PRODUCT

H-Piles: HP 14x89

Sheet Pile: SKS 11, SKS 14, and SKS 16 cold formed sheet piles

PROJECT TIME FRAME

February 2019 to July 2020



The people at Nucor Skyline were very excited about my design and did all they could to help bring it to fruition. I was immediately put in contact with an engineer, who quickly provided me with all the information necessary for the construction plans. Once they received my preliminary drawings, they sent me a construction drawing with all the general details. After a little discussion with the engineering department, we were able to finalize the drawings. Tomas Cabrera from the Florida sales office provided me with a cost estimation for consideration and once approved, provided the rapid delivery of the construction materials. This was key to meet the criteria of the customer and made the project a success.

— Anderson Vasquez-Parra, Design Engineer, Behar Ybarra & Associates