ANCHOR®
BUILD SOMETHING BEAUTIFUL

Landmark®
RETAINING WALL SYSTEM

PROJECT PROFILE

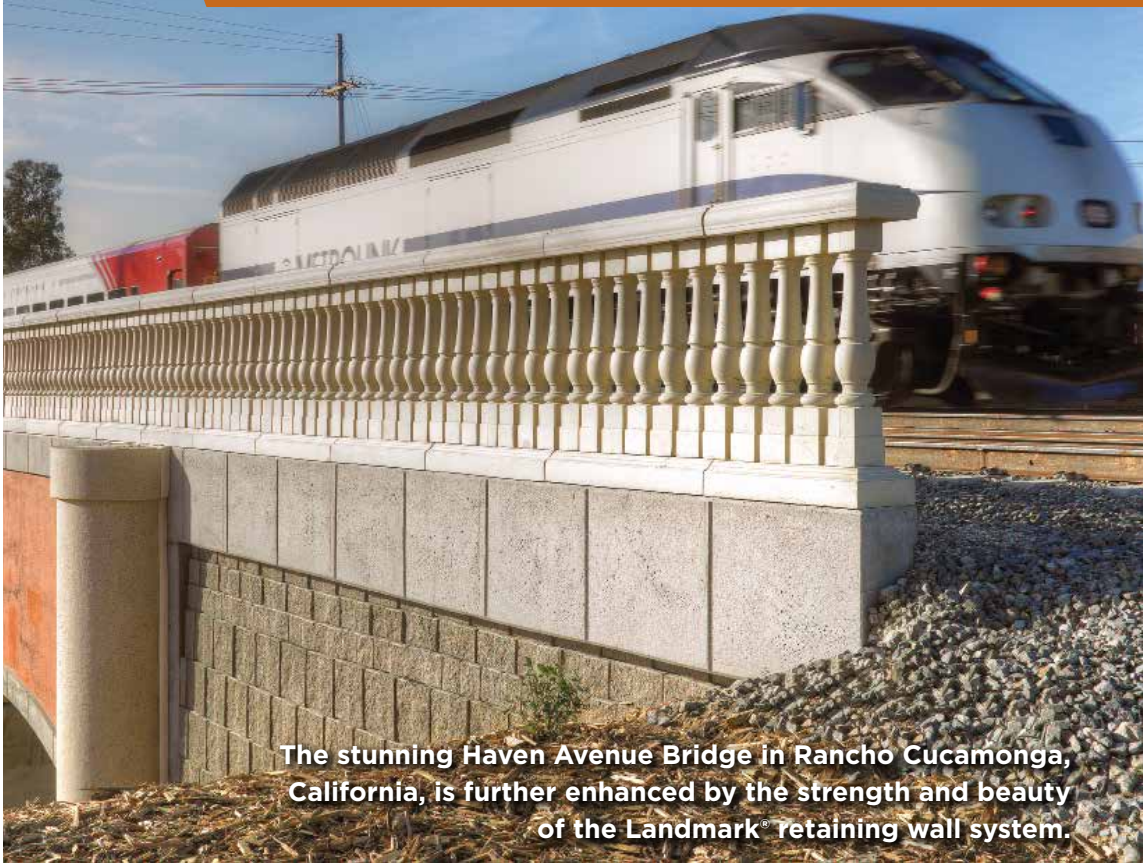
PRODUCT
Landmark® retaining wall system

MANUFACTURER
Sierra Building Products
Fontana, California
BELGARD®

WALL DESIGNER
Daya Bettadapura
ABI Engineering Consultants
Irvine, California

WALL CONTRACTOR
Charles Hickman
KEC Engineering
Corona, California

WALL AREA
2,000 square feet



The stunning Haven Avenue Bridge in Rancho Cucamonga, California, is further enhanced by the strength and beauty of the Landmark® retaining wall system.

Haven Avenue Grade Separation Bridge

RANCHO CUCAMONGA, CALIFORNIA

THE CHALLENGE

Massive traffic congestion was clogging streets and air of Rancho Cucamonga, California, and especially Haven Avenue, a six-lane road near the city's downtown that connects commuters with nearby freeways. The tracks for the Metrolink commuter train and Burlington Northern Santa Fe (BNSF) railway dangerously intersected at grade level at Haven Avenue, and traffic delays were common for nearly 20,000 motorists using Haven Avenue daily. In addition, environmental experts estimated that the idling of cars emitted 2.5 tons of carbon dioxide into the air per day.

The situation required city officials to redevelop the interchange with challenges that included a modest budget of $28 million and the need for a tight schedule that wouldn't interrupt or excessively delay daily traffic.

THE SOLUTION

The city decided an underpass bridge was needed to separate auto and train traffic, thus improving traffic circulation and pedestrian safety. The separation was accomplished by lowering Haven Avenue and its sidewalks 28 feet and reserving its use for vehicles and pedestrians. The underpass bridge was designed to support two train tracks. The city also decided to make the underpass bridge an architectural landmark and gateway to the downtown area. An innovative design not common for underpasses specified the use of colorful precast concrete elements, ornamental railings and integral architectural columns.

The retaining walls at each of the four corners of the 172-foot-long underpass had to contribute to satisfying the structural and aesthetic aspects of the project. Structurally, the retaining walls had to carry full Cooper E-80 loading from the railway tracks. And, the city carefully reviewed all of the building

EVALUATED BY HITEC IN THE UNITED STATES, RTA IN AUSTRALIA AND BBA IN THE UNITED KINGDOM.

materials to ensure they complemented the bridge design. KEC Engineering, the project contractor, used the Caltrans-preapproved Landmark® retaining wall system because it not only exceeded the engineering requirements for the project, it offered value engineering benefits as well.

"The Landmark system was used because it was readily available, attractive and affordable, has a 150-year service life and helped save money during installation," said Charles Hickman, PE, KEC Engineering. "This project had an incredibly tight construction schedule, and we couldn't afford to wait for anything. The block is made in nearby Fontana, and we could have it delivered quickly." Using the Landmark system also saved money (and more time) during construction, according to Hickman, because KEC Engineering used on-site sand for backfill. The originally specified and more costly MSE panel systems required granular backfill, which would have had to be transported to the construction site, compounding time and money the project couldn't spare.

Hickman said the city carefully scrutinized the aesthetics of the Landmark system to ensure it would complement the overall look of the underpass bridge. The city was ultimately pleased with the wall's visual appearance as well as its contrast with the bridge.

THE RESULT

The selection of materials, including the Landmark retaining wall system, turned an ordinary underpass bridge into an attraction. The Landmark system provided considerable value to the city, design engineers and contractor that included competitive cost, availability, aesthetics and construction cost savings. The underpass bridge continues to serve as an architectural marker in Rancho Cucamonga, and it was recognized as the 2010 "Project of the Year" by the American Society of Civil Engineers of San Bernardino and Riverside Counties.

Anchor Wall Systems, Inc., 5959 Baker Road, Suite 390, Minnetonka, MN 55345.
A&B0808 73.3212.1 09/11 4014 500

The award-winning design separates auto and train traffic to improve traffic flow and safety.

The four Landmark® retaining walls flank each corner of the bridge and support full Cooper E-80 loads.

HITEC-EVALUATED

For high performance under extreme loading conditions, the Landmark® retaining wall system is a cost-effective option evaluated by HITEC. The Landmark system features a unique mechanical connection, which allows the system to generate extremely high connection values, independent of blocks above the connection. Developed specifically to meet the high standards of the transportation industry, the performance features of the Landmark system make cost-effective design solutions possible using either the American Association of State Highway and Transportation Officials (AASHTO) or the National Concrete Masonry Association (NCMA) design methodology.