



1996 MERIT BRIDGE AWARD: SPECIAL PURPOSE MARKET SQUARE WALKWAY



THE NEW MARKET SQUARE WALKWAY IN ROANOKE, VA, is designed to bridge the city's past and present, and in doing so, become a key element in its future. The walkway bridges the Norfolk Southern tracks that run through the center of the city. To the south of the tracks is a lively and growing marketplace, home to boutiques, a farmer's market, a regional theater and a potpourri of eateries and lounges. On the north side of the tracks stands the Grand Lady, the Hotel Roanoke and a newly constructed conference center. Closed for a half-dozen years, the old hotel was renovated and reopened in 1995 to provide a home for the city's growing convention industry.

The trick in uniting the two sections of the city was to determine how to merge the hotel's Tudor style and the limestone-based exteriors of the commercial buildings in the city's downtown. The designers decided that the entrances at each end of the bridge would represent the architectural character of its side of the city. The rook-like North Terminal is a "chip" off the hotel building, an octagonal-shaped building clad in limestone. The South Terminal is a 40-sq.-ft., limestone-framed glass enclosure that physically connects the bridge to the First Union Bank Building's parking garage and connects it aesthetically to the downtown market.

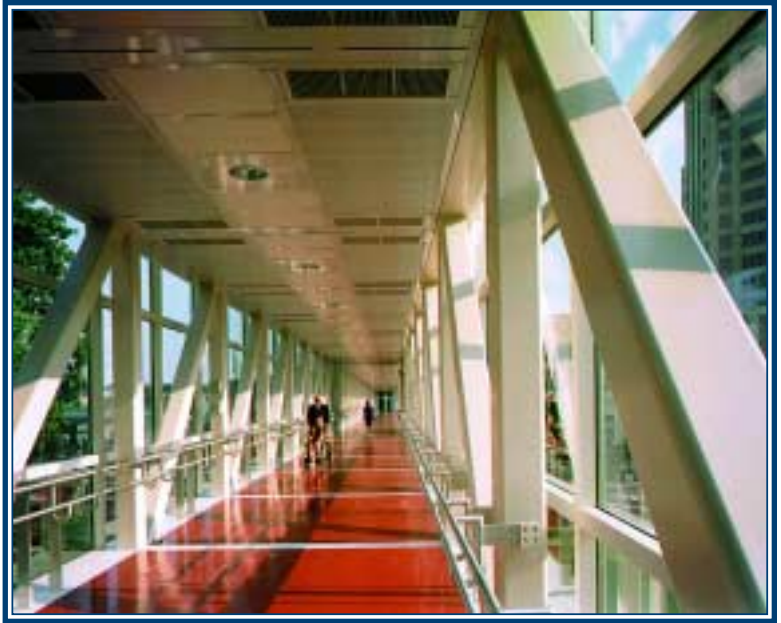
The bridge itself was designed to be almost transparent, both to ensure that the view of the hotel from the city wouldn't be obscured and to give users a feeling of safety at night.

Judges Comments:

"The bridge blends beautifully into its environment at each end and provides pedestrians with a great view of the surrounding city"

OPEN DESIGN

The walkway is a 368'-long structure with spans of 168' and 192'. After considering various alternatives, the designers chose a two-span continuous steel truss consisting of a 36" beam top chord, a 24" beam bottom chord and 10" square tubing of varying wall thicknesses for the web members. The flanges of the selected beams are larger than the



tubes to facilitate fillet welds rather than more costly groove welds to join the web members to the chords. Since the chords were made of beams, splicing was easy to design and fabricate with conventional bolted splice plates used to connect the flanges and webs.

The 360' continuous structure features a Vierendeel truss in the middle of the 168' span. At this point, the bridge widens into an observation deck that allows walkers to stop and view the trains passing underneath without feeling as if they are impeding the foot traffic coming across the bridge. The trusses' diagonal web members are omitted at the 27'-wide cantilevered observation area to allow for an unencumbered view of the railroad and surrounding landmarks.

The remainder of the truss is arranged so that the diagonal members are in compression and vertical members are in tension. While that may, at first blush, seem a strange configuration, the designers configured in this fashion for aesthetic reasons. However, they didn't sacrifice structural efficiency; detailed analysis revealed that the same size members were required for the vertical and diagonal members regardless of which members were in tension and compression.

The 17'-tall trusses were delivered to the site by rail and unloaded at the bridge location. A minimum of field splices facilitated erection of the trusses, which was complicated by the minimal lay-down space available and limit-

Project Team

Designer:
Hayes, Seay, Mattern & Mattern, Inc.
 Roanoke, VA

General Contractor:
Branch Highways, Inc.
 Roanoke, VA

Fabricator:
Carolina Steel Corporation
 Greensboro, NC*

Erector:
Dean Steel Erection, Inc.
 Harrisonburg

Owner:
City of Roanoke, VA

Project Data

Steel wt./sq. ft. of deck:
102 lbs.

Cost:
\$7 million

Steel Tonnage:
274

**Please note that red text denotes an AISC member*

ed window of time for off-loading from the railroad's mainline. The project was completed in just 11 months.

The walkway is heated in winter and ventilated in summer. And the underside is insulated to protect it from the heat of the diesel trains passing only a few feet below.