

The SE 3rd Avenue Bridge is newly recommended NRHP-eligible under Criterion A, in the area of Community Planning and Development, for its significant associations to the historical development of Ft. Lauderdale, and under Criterion C in the area of Engineering, as it embodies the distinguishing engineering characteristics of a mid-twentieth century rolling lift bascule design. It is one of only nine remaining rolling-lift bascule bridges in Florida, of which three are located in Broward County.



Photo 5-72. Boca Inlet Bridge, Palm Beach County (No. 930060)

Haven Ashe/Boca Inlet Bridge

Palm Beach County

FDOT #930060, 8PB14789

This 1963, single-leaf bascule bridge carries A1A over the Boca Inlet in Boca Raton, Palm Beach County. It was selected by the FDOT District 4 bridge engineers as a notable bridge for its Hanover skew bascule design which incorporates a unique counterweight designed in 1943 by Clinton D. Hanover, Jr. of Little Neck, New York. Clinton Hanover is a founding member of the renowned engineering firm Hardesty & Hanover, LLP.

The Boca Inlet Bridge extends 540 feet in length and consists of 11 prestressed concrete girder spans joined to a single-leaf, trunnion-style bascule main span operated by an electric motor. Hardesty & Hanover consulting engineers of New York designed the structure in 1958. The design enables the bridge to cross the Boca Inlet at its sharp, 45-degree skew. Cleary Brothers Construction Company built the structure in 1963. The tender station is a flat-roofed two-story structure located above the direction counterweight.

The significance of the Hanover Skew is to overcome the physical constraints posed by skewed crossings. Prior to the Hanover Skew design, skewed bridge crossings resulted in uneven load distributions, awkwardly placed girders, restricted space for counterweights and their machinery which resulted in a lack of rigidity in the entire structure. A few of the objectives of the Hanover Skew design were to “provide a skew bascule bridge with the shortest feasible span for a given skewed crossing, having simple and rigid framing; and to provide a skew bascule bridge such that a satisfactory single-leaf skew bascule bridge can be used where otherwise much more expensive double-leaf bascule bridge without skew, swing bridge, or retractable drawbridge, would be necessary.”¹³² Upon operation, the angle of the single-leaf is apparent and the jagged pivot joint on the deck is noticeable when walking across the bridge.

The Boca Inlet Bridge is one of only four bridges of its type built in the U.S. using the Hanover skew design, also known as a knee-girder bascule. The first, and only one constructed outside of Florida, is the 1942 Hamilton Avenue Bridge in Brooklyn, New York. The Hamilton Avenue Bridge was replaced in 2007-2008. The span and approach superstructure of each span was demolished and replaced with a new

¹³² Hanover, Clinton D. “United States Patent Office 2,337,994 - Skew Bascule Bridge.” United States Patent Office. Application May 3, 1943, Serial No. 485,505. Accessed at: <http://patft.uspto.gov/netahtml/PTO/srchnum.htm>.

structure.¹³³ The three other bridges of this type include two in Miami and the Boca Inlet Bridge.¹³⁴ The SE 4th Avenue Hanover Skew Bascule Bridge (FDOT #874131) was completely demolished and replaced in 2003 by Bridge No. 874145. The 1950 NW 36th Street Hanover Bascule Bridge over the Miami Canal (FDOT #870625), while extant, has had its machinery removed, and is no longer operational as a bascule bridge.¹³⁵

The Boca Inlet Bridge is newly recommended NRHP-eligible under Criterion C in the area of Engineering as the only intact and functioning bascule bridge in the United States possessing the patented Hanover skew design. In addition to its importance to Florida, this bridge is significant at the national level as an extremely unique and complex moveable structure in terms of both design and structure.

George Bush Boulevard Bridge/NE
8th Street Bridge
Palm Beach County
FDOT #930026, 8PB13707

This double-leaf, rolling lift bascule bridge, completed in 1949, carries George Bush Boulevard (formerly NE 8th Street) over the Intracoastal Waterway in Delray Beach. It was built by the Murphy Brothers Construction Company based on plans approved by the Palm Beach County Engineer, J.M. Boyd. Bridge construction was funded by municipal bonds, as well as the County Commission and the State Road Department. The 270-foot long by 33-foot wide structure is comprised of the



Photo 5-73. George Bush Boulevard Bridge/NE 8th Street Bridge, Palm Beach County (No. 930026)

80-foot main steel bascule span and four approach spans of reinforced concrete. The original slotted rail concrete balustrade was covered, in 2003, with recessed metal panels. The tender station, completed in 1950, is located on the south side of the bridge. The concrete building features a metal hipped roof (ca. 2005), center hipped cupola, and a quatrefoil design on the north elevation.

The George Bush Boulevard Bridge was determined eligible for listing in the NRHP by the SHPO on April 16, 2008. It is significant under Criterion A in the area of Community Planning and Development for its historical associations with the post-World War II land boom in Delray Beach. It played a major role in promoting the growth of the city by providing the improved access which was instrumental in shaping the area's development. It is also eligible under Criterion C in the area of Engineering, as it embodies the distinguishing engineering characteristics of a mid-twentieth century rolling lift bascule design. Bridges of this type are very rare in Florida, with only nine remaining. Of these, three are located in Palm Beach County.

¹³³ "Replacement of Rare Hanover Skewed Bascule, The Hamilton Avenue Bridge." Accessed at: <http://www.ascemetsection.org/content/view/414/129>.

¹³⁴ NSBA (National Steel Bridge Alliance). "NSBA 2009: Prize Bridge Competition" in *Structure: A Joint Publication of NCSEA/CASE/SEI*. October 2008. Accessed at: <http://www.structuremag.org/article.aspx?articleID=775>.

¹³⁵ Noles, Timothy, P.E.. Personal communication. Principal, Hardesty & Hanover - Miami, FL. October 13, 2010.