

The GREAT BRIDGE ARCHITECT/DESIGNER (Othmar Ammann left his Mark on New York City)

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Perhaps no twentieth-century engineer has left a more visible mark on a major city than had Othmar Ammann on New York. His five major bridges bear much of the enormous traffic flow to and from the city. They are beautiful and efficient structures, for Ammann achieved an uncommon harmony of visual elegance, simplicity, and power with practical design.

Othmar Ammann

Born in Switzerland, Othmar Ammann attended the Federal Polytechnic Institute of Zurich and earned an engineering degree in 1902. He had an interest in and an aptitude for mathematics and physics.

Coming to the United States

In August of 1907 the Quebec Bridge over the St. Lawrence River in Canada collapsed while under construction. Ammann offered to assist in the investigation of the collapse; his well-written report on the disaster earned him respect in his profession.

The Hell Gate Bridge

In 1912 Ammann was a chief assistant to Gustav Lindenthal, who was preparing for the great railroad bridge between Queens and Wards Island known as Hell Gate. The span was large; the ultimate design would be the longest arch-type bridge in the world. The rapid tidal currents made impossible to erect scaffolding in the river. The Hell Gate Bridge opened in 1917 and its design communicates rigidity with almost all its weight and outward thrust carried by the lower of the two steel arches.

Hudson River Bridge

Ammann's final design for the Hudson River bridge called for a 3,500-foot span twice the length of any existing bridge, between Fort Lee in New Jersey and 179 Street in Manhattan. Ammann chose this site because the Hudson narrows at this point and both ends of the bridge would be undeveloped areas. Ammann remarked that a graceful suspension bridge, provided what may be the most striking single visual characteristic of his suspension bridge designs.

The George Washington Bridge

The George Washington Bridge, was completed in 1931, nearly two years after the stock market crash and well into the Great Depression. The bridge was built under budget but the Port Authority could hardly afford the concrete and stone planned for the towers. Ammann had

expected this decision and the original towers were replaced with steel frames designed to carry both the concrete and the stone facing.

While designing the George Washington Bridge, Ammann realized that the weight of the deck was so great, five times the maximum live load-that no stiffening system would be necessary. The strikingly thin deck of the George Washington provided a distinctive appearance against the massive towers, appealing to architects and engineers alike. That appearance was hardly marred when a second deck was added to carry increased traffic in 1962; the addition had been planned for in the original design, and Ammann himself was hired to implement it.

The Bayonne Bridge

In 1930, as the George Washington Bridge was being built, Ammann was named chief engineer of the Port of New York Authority, one his jobs included designing a bridge across the waterway between New Jersey and Staten Island. Just as the George Washington pushed the suspension bridge to new limits of size, the Kill Van Kull span, eventually named the Bayonne Bridge, was by far the largest steel arch yet built.

The Bronx-Whitestone Bridge

In 1939 Ammann completed another bridge, between Queens and the Bronx, called the Bronx-Whitestone Bridge. He worked with a new architect on the project, Aymar Embury II, and his approach is evident throughout the design. The towers of the Bronx-Whitestone Bridge are flat, smooth rectangles with open arch portals and similar arches supporting the roadway. The towers do not taper, and no ornamentation has been applied. The anchorages and tower foundations are simple concrete blocks.

The Verrazano-Narrows Bridge

The new science of aerodynamics allowed Ammann to apply his aesthetic principles to his final, greatest achievement. Since the early 1920s the need had been recognized for a crossing at the mile-wide entrance to New York Harbor. It was only in the late 1950s that serious planning began for what would become the Verrazano-Narrows Bridge.

Othmar Ammann's Legacy

Between then and his death in 1965 at the age of eighty-six, Ammann directed three major construction projects an immense amount of work for any engineer, let alone one of his years. Within that time Ammann was responsible for planning the Verrazano-Narrows Bridge, for adding the second deck to the George Washington Bridge, and for building the Throgs Neck

Bridge over the East River. Less than two miles from the Bronx-Whitestone Bridge, the Throgs Neck is similar in size, capacity, and appearance; it first carried traffic in 1961.

The final triumph confirmed Ammann's status among his colleagues as the greatest steel-bridge designer in the world. The revolutionary deck of the Verrazano-Narrows Bridge was described in a 1980 symposium as "a radical departure from previous norms" that "may, in retrospect, have been one of the most significant and least publicized contributions of American suspension bridge engineering."

Today engineers of public structures consider visual elegance a necessity. Contemporaries of Ammann applied similar principles of structural art to new materials and different kinds of structures, but Ammann's progression toward an artistic engineering approach was especially influential among engineers. No engineer who commutes between New York and New Jersey can fail to be impressed by the George Washington Bridge.