American Society of Civil Engineers, San Diego Section Historic Civil Engineering Landmark NORTH PARK WATER TOWER



Story by Katherine Hon, Graphics/Photos courtesy City of San Diego and Phil Kern



The steel elevated water storage tank locally known as the "North Park Water Tower" (but officially known as the University Heights Water Tower) looms large over the heart of San Diego's earliest streetcar suburbs. At 127 feet tall, the 1.2-million-gallon elevated tank can be seen for miles and is a beloved community icon. The tank was constructed in 1924 and reflects a uniquely robust design. It was listed in the National Register of Historic Places on June 25, 2013 as part of the University Heights Water Storage and Pumping Station Historic District. The water tower is owned by the City of San Diego and sits in the center of a still-active water supply facility complex. Although empty since the 1990s when more stringent seismic criteria were implemented, the elevated tank is a rare and unique example of a type commonly associated with early 20th century municipal water delivery systems throughout the United States. It is the only surviving example of an early 20th century

full hemispherical bottom, elevated water storage tank associated with a municipally owned and operated water storage and distribution reservoir in San Diego County.

The nomination package for the historic district was prepared by California historian Alexander Bevil and sponsored by the North Park Historical Society. The nomination describes the riveted steel tank as consisting of the following interrelated sections: a finialtopped conical cap, tubular tank shell, scaling ladder, circular catwalk, hemispherical ellipsoidal bottom, "Z" zig-zag strapped channel iron girder support legs, and concrete foundation piers. A central riser contains infill and outflow pipes connecting the tank to an underground valve vault. A unique design feature typical of early 20th century elevated hemispherical ellipsoidal water towers is the joining of the tops of all twelve diagonal-braced steel girder support legs directly to a circumferential ring around the tank shell, not to the tank's riveted steel plate outer walls. By doing so, the tower becomes one single unified symmetrical structure.



Diagonal steel "X" tension braces, with screw-threaded turnbuckles, and horizontal flanged steel braces hold the tower legs taut.

The structure is the only known example of a full hemispherical bottom elevated riveted steel plate water storage tank supported by 12 Z-laced girder steel legs in Southern California, if not the entire western United States. As seen in the historical photograph of the tower under construction, it was reputed to be the "largest elevated tank in the world" in 1924. The water supply facilities in the designated historic district including the water tower have a long history that began in 1908, when City Engineer A. F. Growell designed and supervised the installation of a partially buried concrete reservoir along the western perimeter of Block 122 along Oregon Street. Stretching from El Cajon Boulevard south to Howard Avenue, the 337.60-foot long, by 150-foot wide, by 10-foot deep "north" reservoir would hold 3.172 million gallons of water from the newly acquired Otay/Chollas water supply line. In order to provide an adequate reserve of water at the University Heights Water Storage and Pumping Station, the City of San Diego purchased all of Block 151 south of the 1908-built concrete reservoir from the College Hill Land Association. The purpose was for the City Engineer to design and supervise the construction of an additional 17.5-million-gallon capacity concrete water storage reservoir south of Howard Avenue. Wooden boards covered both reservoirs.

In order to provide adequate pressure within the system, in 1910 City Engineer Edwin M. Capps designed and installed a 52.2-foothigh by 40-foot-diameter 490,660-gallon capacity upright cylindrical metal water stand pipe near the reservoir. During the early 1920s, the City Water Department discovered that the metal stand pipe next to the north reservoir did not provide enough pressure for the rapidly growing surrounding streetcar suburbs. The City Engineer and fire insurance companies urged city leaders to invest in the area's future by increasing the ability to distribute water under constant



pressure to fight fires in the surrounding communities. For example, if a major conflagration were to occur, the University Heights reservoirs could dry up, forcing the rest of the city to depend on a 24-inch wooden pipe line from the Chollas Reservoir. Both the City Engineer and fire insurance companies recommended the city extend a new 30-inch diameter cast iron pipeline from the Chollas reservoir to the University Heights facility. However, the San Diego Water Department's hydraulic engineer recommended choice was to erect an elevated riveted steel plate water tank instead of an additional and far more costly pipeline. The City's decision to accept the Water Department's recommendation would reflect its continued acceptance of then innovative American hydraulic engineering design principles.

After the passage of a municipal bond act in 1923, the City of San Diego awarded a contract to the Pittsburg-Des Moines Steel Corporation to erect a 1.2-million-gallon capacity elevated metal water tank on the southeast corner of Block 122 in University Heights. The elevated tank was completed the following year. It still stands as the City's most visible urban water storage facility and a testament to the engineering required to supply water for a growing city.