

Klyde Warren Park—Dallas

by Mir H. Ali, Jacobs Engineering Group Inc.

When the residents and city leaders of Dallas, Tex., wanted to connect the two parts of the city separated by the depressed Woodall Rodgers Freeway, they decided to create a park with many amenities above the freeway. This public-private partnership project was funded by the Woodall Rodgers Park Foundation, City of Dallas, Texas Department of Transportation, and the Federal Highway Administration. The park is named the Klyde Warren Park.

Structural System

One of the challenges in the design was to set the park elevation at the same elevation as the frontage roads, to provide access from the frontage roads without climbing steps, while maintaining the minimum vertical clearance of 16 ft 6 in. under the deck. This required the selection of the most efficient structural system with minimum structural depth.

The deck carries the heavy loads of trees, soil, buildings, and other amenities. Another important consideration in selection of the deck structural system was to accommodate the tree root bulbs within the structural depth, so that no soil mounds had to be created to plant the trees.

The superstructure consists of two spans of about 100 ft each with post-tensioned concrete box beams made continuous over the middle support for the superimposed dead and live loads. The prestressed concrete box beams are arranged in groups of three or more. Concrete panels are placed between the beam groups to form trenches to accommodate the tree root bulbs; the trenches act like planter boxes. The concrete panels are supported on ledges formed on the sides of the edge beams.

The trenches are also used to accommodate the utility lines including a 16-in.-diameter water line, gas lines, and many fiber optic-cables, telephone lines, and electrical lines. Two utility bridges across the Woodall Rodgers Freeway were removed in phases as the utilities were relocated to the new deck.

The loads of every feature and element on the deck were accounted for in the design. The superimposed dead loads on the deck were drastically reduced by using expanded polystyrene (EPS) and engineered lightweight fill (kiln-dried expanded shale and clay) wherever planting soil was not needed. The EPS



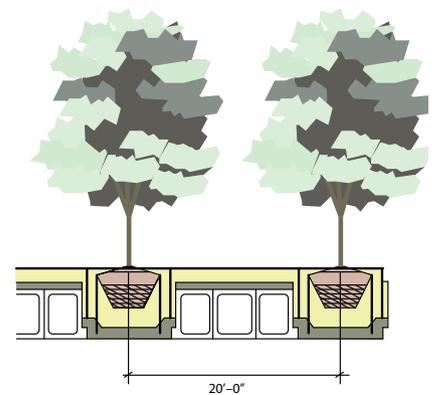
When complete, Klyde Warren Park will include a lawn, children's park, botanical garden, dog park, fountains, groves, reading and games courtyard, performance pavilion, restaurant, and rest rooms. Photo: Aerial Photography Inc., Dallas, Tex.

weighs 1.8 lb/ft³ and engineered lightweight fill weighs 65 lb/ft³ compared to the normal density of soil, which is about 120 lb/ft³.

The deck is waterproofed with a liquid-applied asphalt system, protective board, drainage mat, and root repellent. The root repellent is used to prevent the roots from growing into the waterproofing and structural elements.

Tunnel Created

By covering the freeway with the deck, it converted the depressed open freeway into a tunnel. This required the application of all the current safety requirement of National Fire Protection Association. The deck structure and the deck supports needed to be fire protected for two hours. Emergency ventilation fans were installed to facilitate the removal of smoke build up in case of a fire. Lighting was installed including transition lighting at the entrances. 



Cross section of the tree trench. Drawing: Jacobs Engineering Group Inc.

EDITOR'S NOTE

Note: This is an edited version, to read the complete article visit www.aspirebridge.org, and click on "Resources."

Mir H. Ali is manager of engineering, structures principal, Jacobs Engineering Group Inc., Dallas, Tex.