PROJECT PROFILE

# MacArthur Maze Fire and Collapse

Fire-damage Assessment and Structural Testing | Oakland, CA

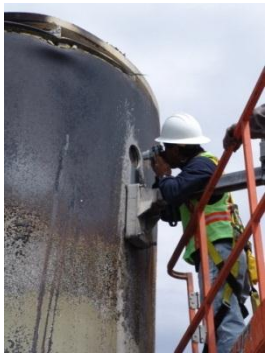
**CLIENT**

California Department of Transportation (Caltrans)

**BACKGROUND**

The MacArthur Maze is a multidirectional freeway interchange that dates back to the 1930s. The structure features a reinforced concrete substructure and structural steel plate girder and reinforced concrete deck superstructure elements. The substructure piers were previously retrofitted with steel jackets for seismic considerations.

In April 2007, a gasoline tanker truck overturned and caught fire on the Interstate 880 connector—an elevated roadway structure that is part of a series of ramps and roadways known as the MacArthur Maze. The intense heat from the fire weakened the steel girders of the roadway directly above, collapsing approximately 165 feet of the elevated roadway onto I-880 below. Caltrans needed assistance investigating the extent of the fire damage to determine appropriate repair strategies and reopen both affected roadways as quickly as possible.



**SOLUTION**

WJE arrived on-site the day following the fire to provide emergency structural engineering services to Caltrans. Engineers worked throughout the following days to obtain concrete core samples for testing and to accurately document the extent of fire damage to the structural elements using a wide range of nondestructive testing methods. Five days after the fire, WJE issued a comprehensive report on the affected structural elements.

WJE's investigation, testing, and analyses indicated that the I-880 structure had not sustained significant damage from the fire and subsequent collapse of I-580. It was also determined that the primary support piers for the I-580 structure would not have to be replaced. Based on WJE's efforts, Caltrans was able to open the I-880 connector and clearly define the scope of the I-580 repairs eight days after the fire. The entire MacArthur Maze reopened just twenty-five days after the fire, resulting in significantly less severe impact on the region than originally feared.

WJE ENGINEERS ARCHITECTS MATERIALS SCIENTISTS