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Chapter 12

Point Pleasant 'Silver' Bridge

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This chapter presents the forensic investigations of the collapse of the Point Pleasant Bridge. The collapse of this bridge has left important lessons learnt about, among other issues, the importance of the choice of the appropriate fracture-toughness steel to be used in bridges, the concept of structural redundancy, and the correct and systematic need for inspection and maintenance of existing bridges.
Likewise, it was the beginning of important modifications in the analysis of fracture and fatigue of steel bridges in the standards and codes.

12.1 Introduction

The Point Pleasant Bridge, which carried U.S. 35 highway over the Ohio River, was located between Point Pleasant, West Virginia, and Kanauga, Ohio. The bridge was also known as the "Silver Bridge" because it was one of the major structures to be painted with aluminium paint. It was one of two nearly identical and unique eyebar chain suspension bridges in the U.S. The other bridge, also spanning the Ohio River, was at St. Mary's, West Virginia, until it was dismantled (Figure 12.1).

On December 15, 1967, Point Pleasant Bridge collapsed without warning, resulting in the loss of 46 lives (Figure 12.2) due to stress cracking corrosion of an eyebar.

12.2 Structural Characteristics of the Bridge

The Point Pleasant Bridge was an eyebar chain suspension bridge (top chord) with its axis in an east-west direction over the Ohio River. It had a 700 ft centre or main span and two 380 ft side spans, as shown in Figure 12.3. In addition, there were two approach spans on each side of the bridge, which were plate girder spans 75.25 ft and 71.50 ft in length supported on concrete piers. The two suspension bridge towers extended 130 ft 10.25 in. above the top of the two main piers. The total length of the bridge was 1,753 ft.

The roadway of the suspended span, as originally built in 1928, consisted of a timber deck and sidewalks. In 1941, the timber deck was replaced with a 3-inch-deep steel grid