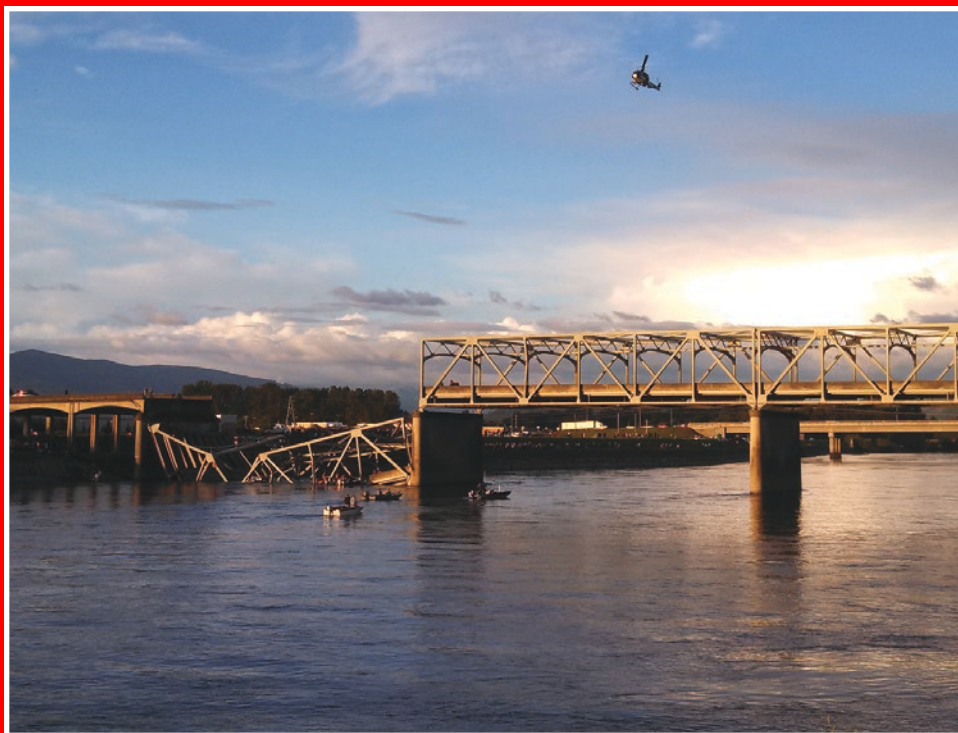


Failure Case Studies

Steel Structures



Forensic Engineering Division

Navid Nastar, Ph.D., P.E., S.E.

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ASCE

Failure Case Studies

Steel Structures

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Preface

This publication was developed by the Education Committee of the Forensic Engineering Division of the American Society of Civil Engineers (ASCE). The current document is the first in the *Failure Case Studies* series in Civil Engineering and presents eight case studies of failures observed in steel structures between 1970 and 2013.

Failures in Civil Engineering: Structural, Foundation and Geoenvironmental Case Studies was first published by ASCE in 1995. Edited by Robin Shepherd and J. David Frost, the publication collected short descriptions and relevant references for 43 failure case studies. Subsequently, the Education Committee of the Forensic Engineering Division of ASCE published a second edition of the document in 2013, retitled *Failure Case Studies in Civil Engineering: Structures, Foundations, and the Geoenvironment*, with updates and additional case studies.

The *Failure Case Studies* series is a follow-on project to previous efforts by the ASCE Forensic Engineering Division and is intended to promote learning from failures by disseminating information regarding previous failure cases. The purpose of the *Failure Case Studies* series and their predecessor documents is to promote failure literacy to improve the practice of civil engineering and to reduce risk to the public.

Each case study in this document presents a summary description of a documented civil engineering failure, followed by *lessons learned* from the failure and *references* for further study.

The reader is reminded that each case study only contains the findings of the research and literature review by the author(s) who directly contributed to that particular case study, based on the published results of failure investigations for each case. The contents of this document do not represent the professional or personal opinions and views of the editors, authors, contributors, or ASCE.