

# Education Initiatives of the ASCE Forensic Engineering Division

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# Forensic engineering

ASCE  
TCFE  
(Now  
FED)



# Image & Influence



**THINK OF IT AS ANOTHER JOB SITE.**



**ENR June 4, 1987**

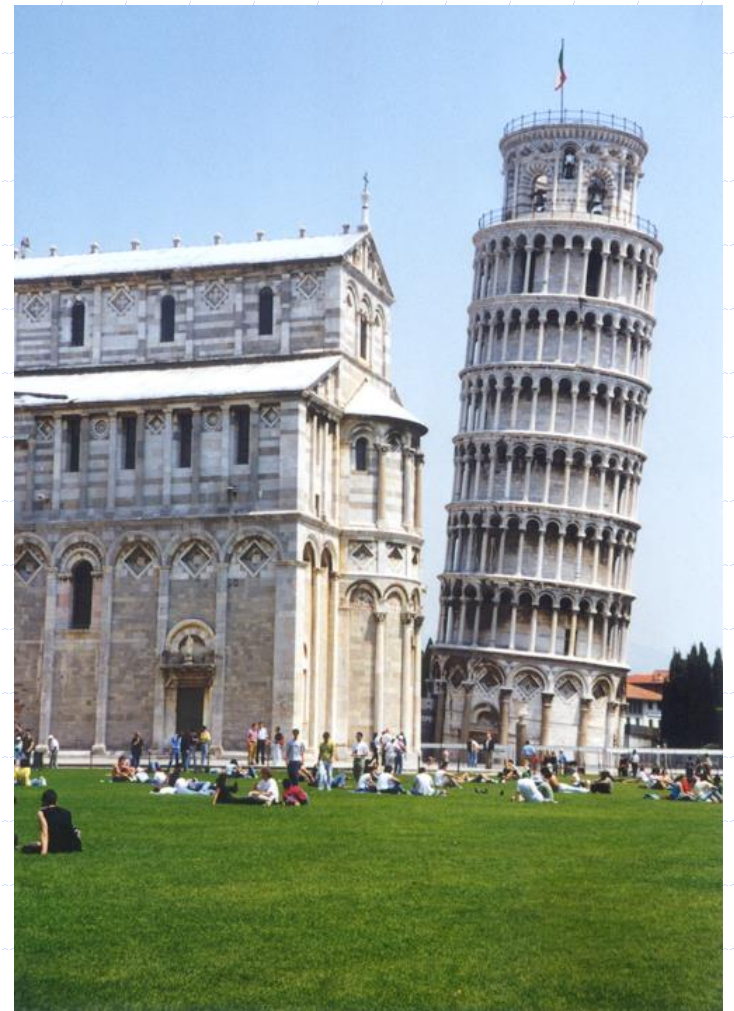
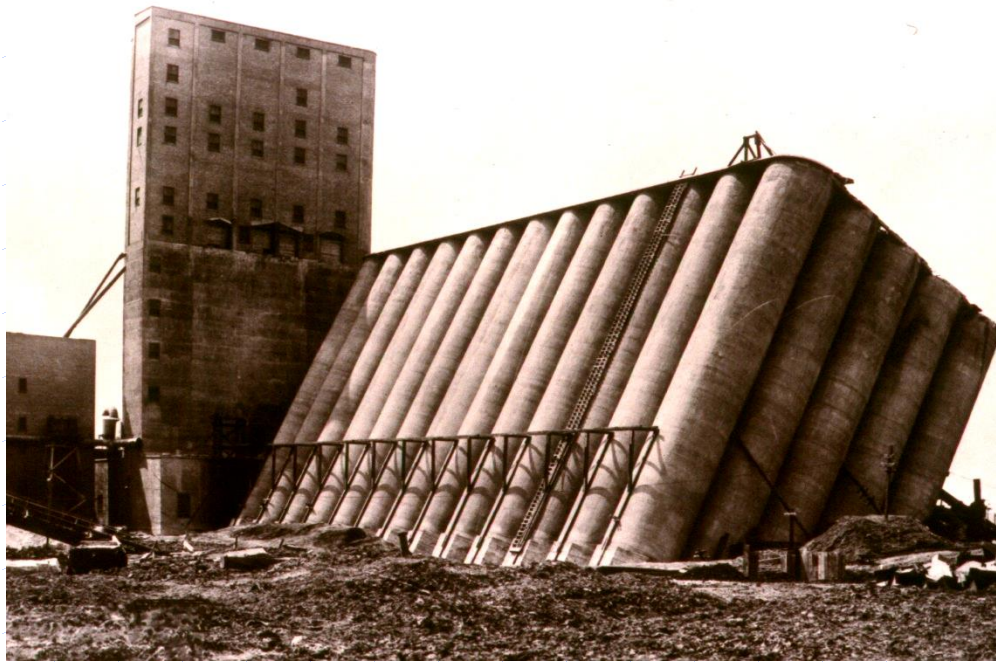


**R**  
*Forensic engineers*  
**Experts for hire**

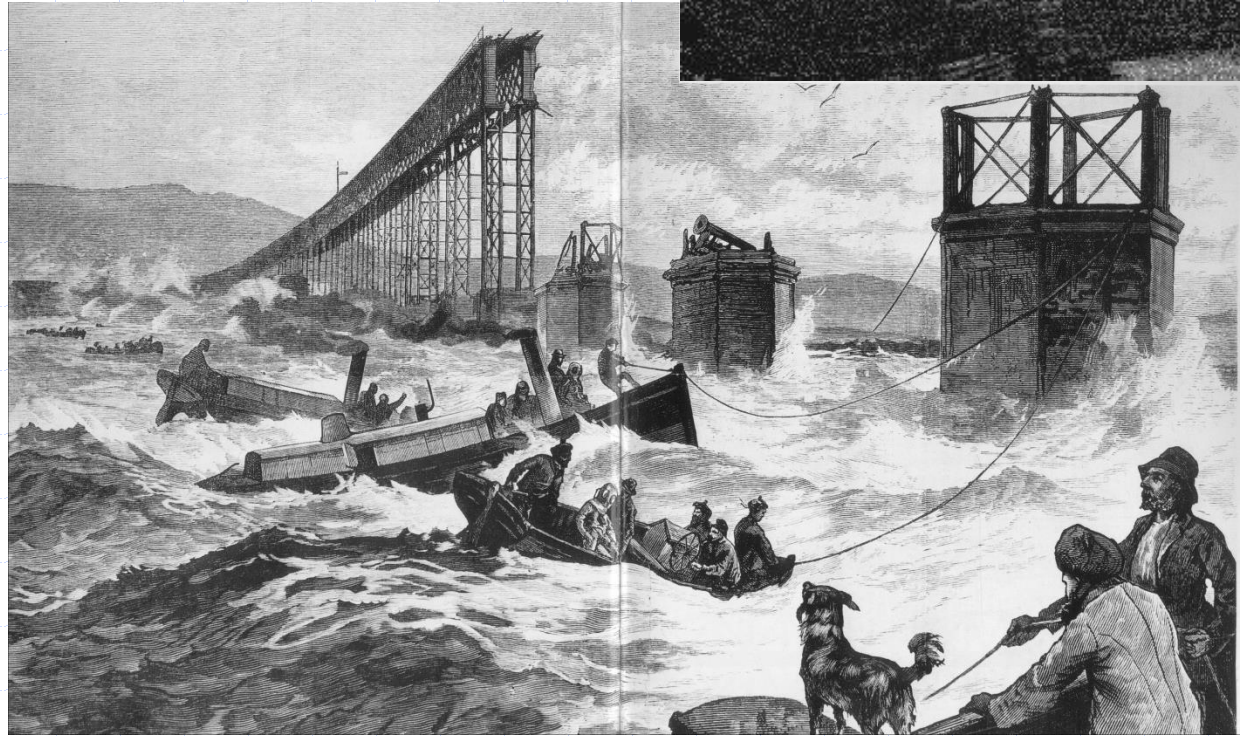
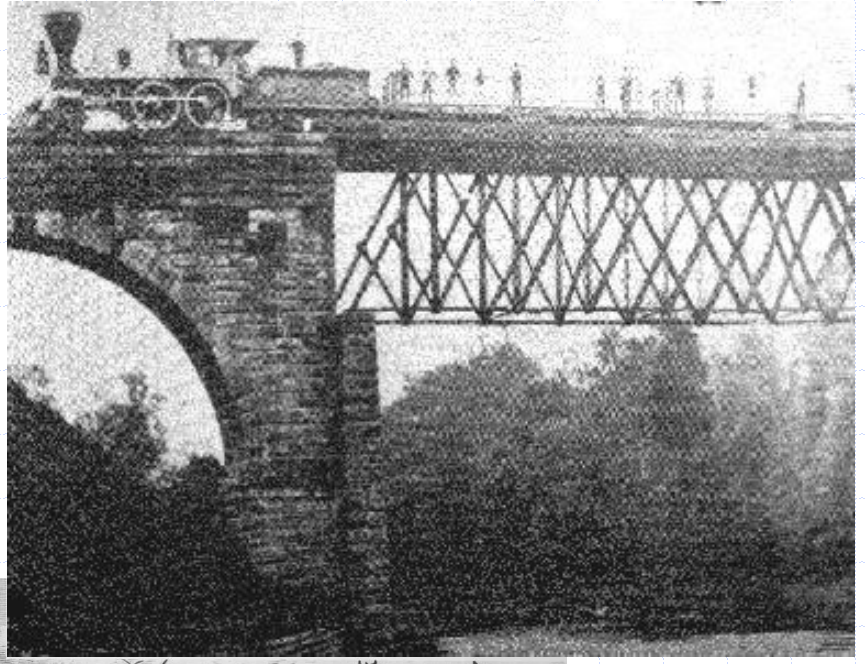
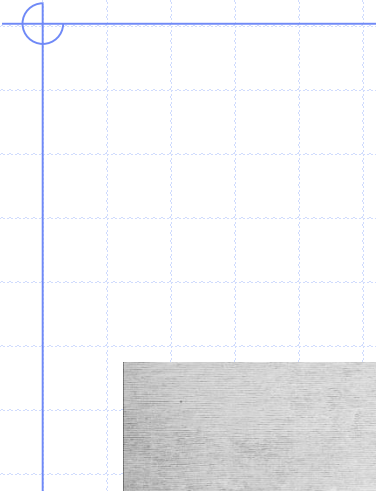
# Failure...



Performance that falls short of expectations.



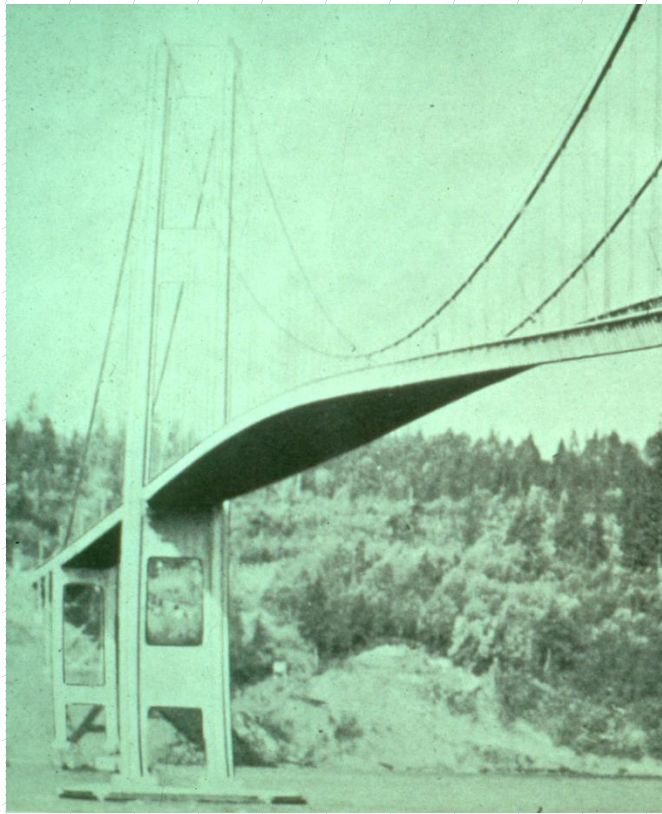












# Forensic engineering

- the application of engineering principles to legal problems
- investigations, analyses, reports
- dispute resolution
- information dissemination
- engineering pathology



# **TCFE established in 1985**

**1970-1985: A period of self-examination for the design & construction industry**

# Failures of completed structures (1970-83)

- 1978: Teton Dam, Idaho
- 1978: Coliseum, Hartford, CT
- 1978: Post Auditorium, Greenvale, NY
- 1979: Kemper Arena, Kansas City, MO
- 1981: Hyatt walkways, Kansas City, MO
- 1983: Mianus River Bridge, CT

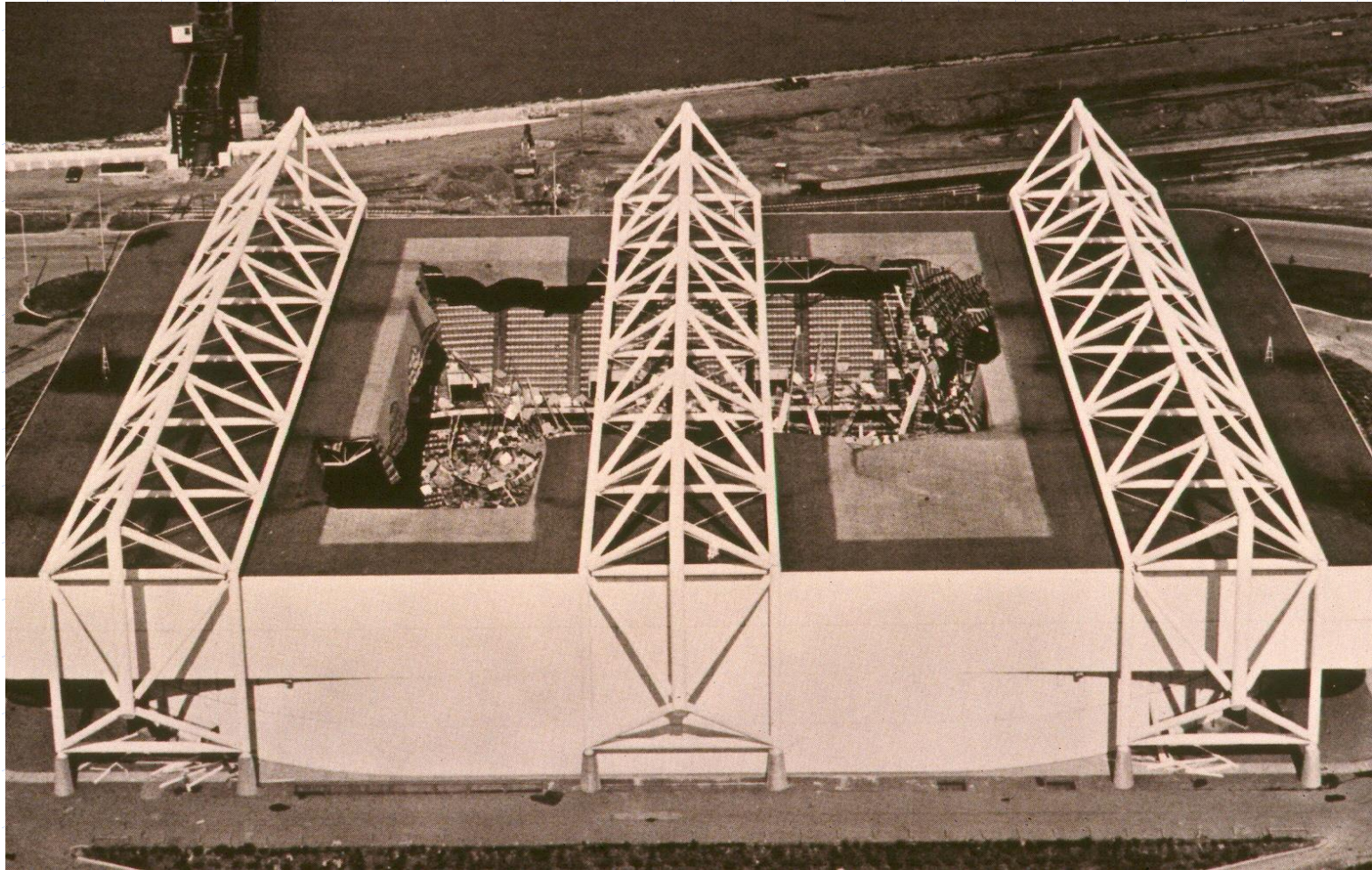


# Failures of completed structures (1970-83)





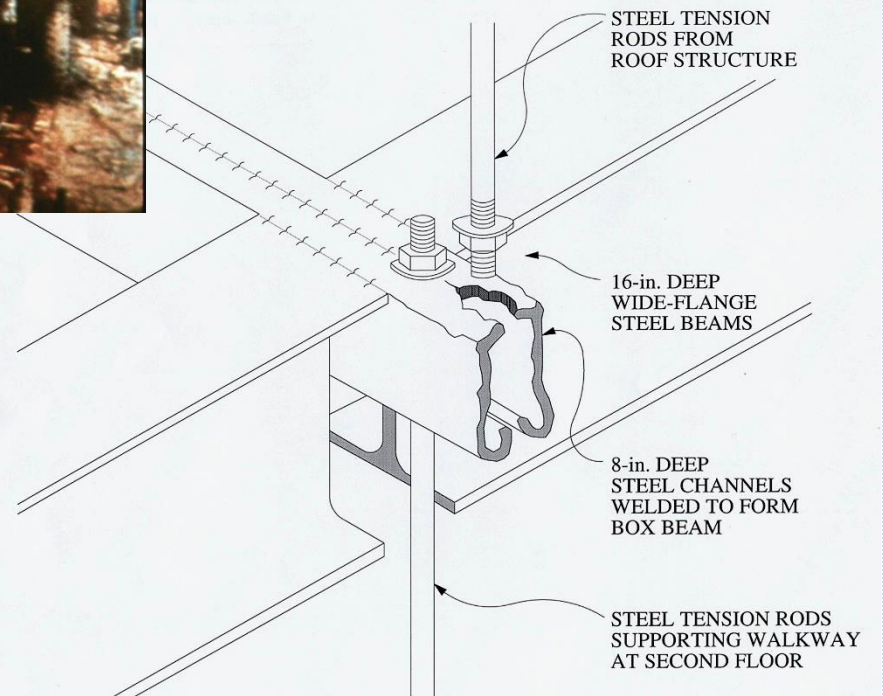
# Failures of completed structures (1970-83)





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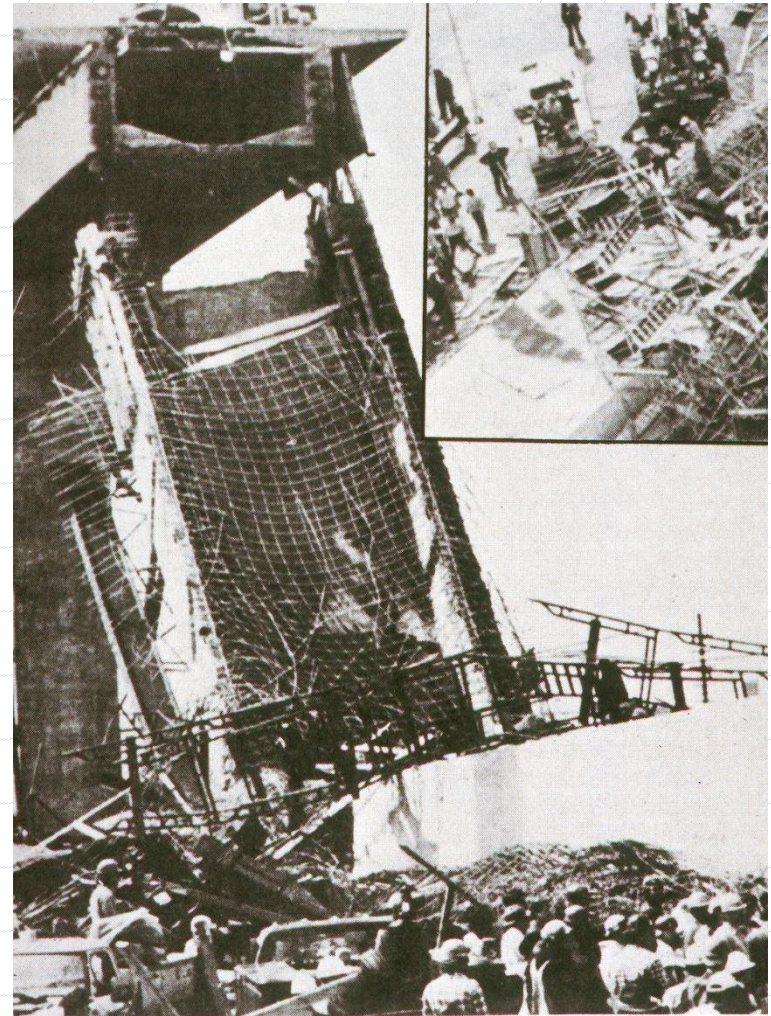
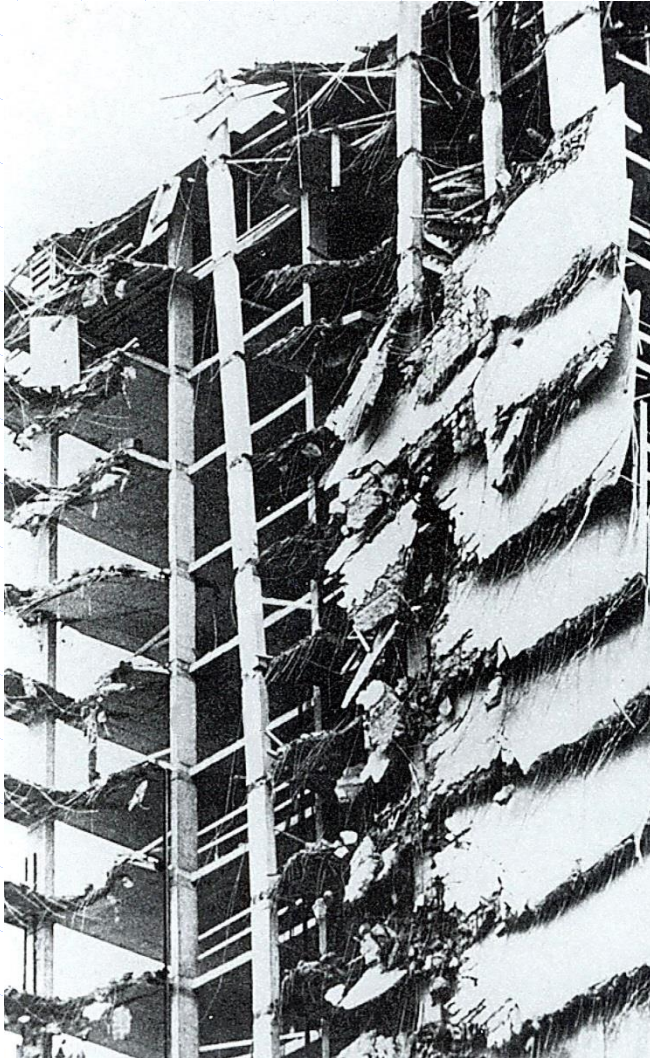




# **Construction accidents (1970-83)**

- 1970: Commonwealth Ave., Boston
- 1973: Baileys Crossroads Apts., VA
- 1978: Cooling Tower, Willow Island, WV
- 1979: Rosemont Horizon Arena, Chicago
- 1981: Harbour Cay Condominiums, FL
- 1982: Freeway ramp, East Chicago, IN

# Construction accidents (1970-83)



Sections lie shattered following collapse and 50-ft fall that killed 12 workers



# Response of public & profession

- US Congressional hearings (1982, 1984)
- AEPIC, University of Maryland (1982)
- NBS/NIST involvement in investigations
- Engineering Foundation conferences
  - Structural Failures I: Santa Barbara (1983)
  - Structural Failures II: Palm Coast, FL (1987)
- Const. Ind. Roundtable, Kansas City (1986)
- Ctr. for Excell. in Const. Safety, WVU (1987)

# Response within ASCE

- Committee on Forensic Engineering (1982)
- Survey of ASCE membership (1983)
- Comm. on Failure Info. Dissemination (1983)
- International survey: dissemination activities
- Construction Failures Conf., Houston (1983)
- Reducing Failures Conf., Clearwtr, FL (1985)
- Technical Council on Forensic Eng. (1985)
- Jrnl. of Perf. of Constr. Facilities (1986)



# **TCFE Information dissemination**

- Conference sessions
- Symposia
- Forensic Engineering Congresses
- Guidelines
- Monographs
- Education Committee products
- Jrnl. of Performance of Constructed Facilities

# TCFE Congresses

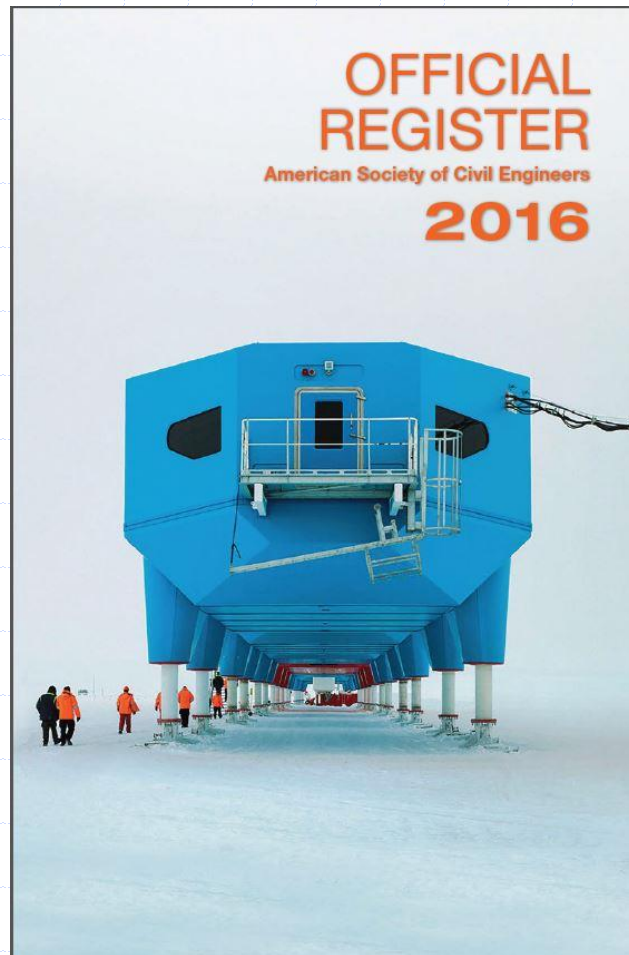
- Minneapolis, MN (Oct. 1997)
- San Juan, PR (May 2000)
- San Diego, CA (Oct. 2003)
- Cleveland, OH (Oct. 2006)
- Washington, DC (Nov. 2009)
- San Francisco, CA (Nov. 2012)
- Miami, FL (Nov. 2015)



# Resources

- ASCE/TCFE publications
- Books
- Journals & magazines
- Investigation reports
- Videos
- Internet sites
- Other sources

# Forensic Engineering Division (FED)



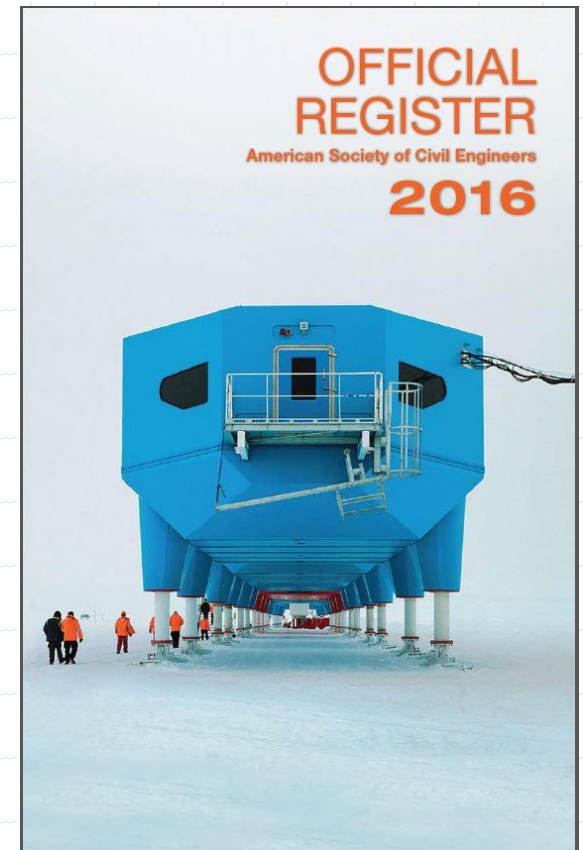
The purpose of the Forensic Engineering Division is to

- develop practices and procedures to reduce the number of such failures,
- disseminate information on failures and their causes,
- provide guidelines for conducting failure investigations, and
- provide guidelines for ethical conduct in Forensic Engineering.



# FED Committees

- ◆ Executive
- ◆ Awards
- ◆ Education
- ◆ Dissemination of Failure Information
- ◆ Forensic Investigations
- ◆ Forensic Practices
- ◆ International Activities
- ◆ Practices to Reduce Failures
- ◆ Publications



# Awards Committee



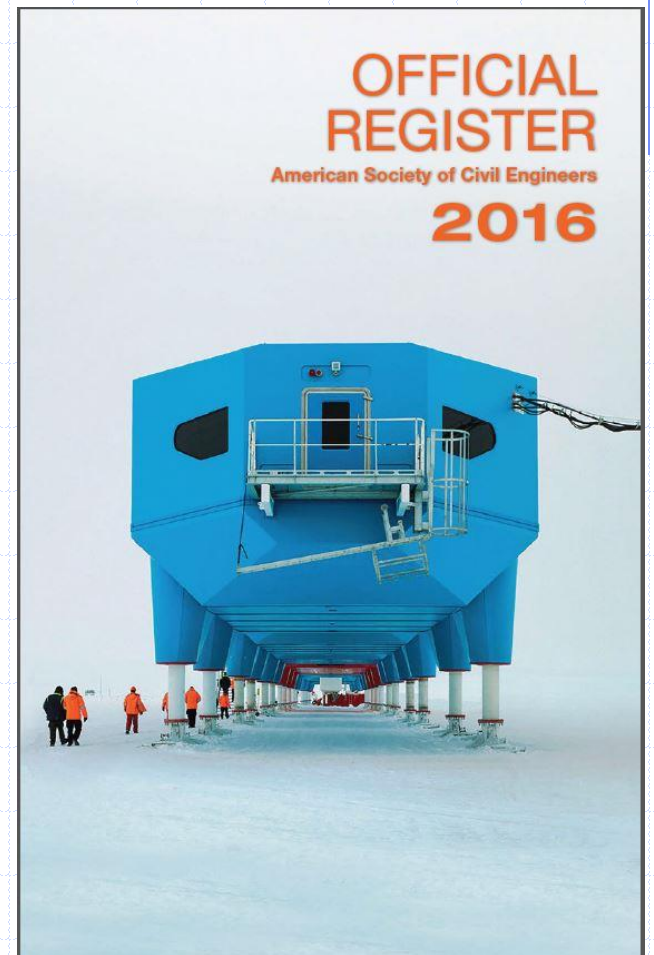
The mission of the Awards Committee is to make recommendations to the Executive Committee regarding all awards in which the Forensic Engineering Division has an interest, including nomination of recipients.



# Education Committee

## Mission:

Promote failure literacy to improve the practice of civil engineering and to reduce risk to the public. Provide failure case study resources for educational activities through educators' workshops, undergraduate and graduate coursework, published chapters and volumes, and presentations, both nationally and internationally.

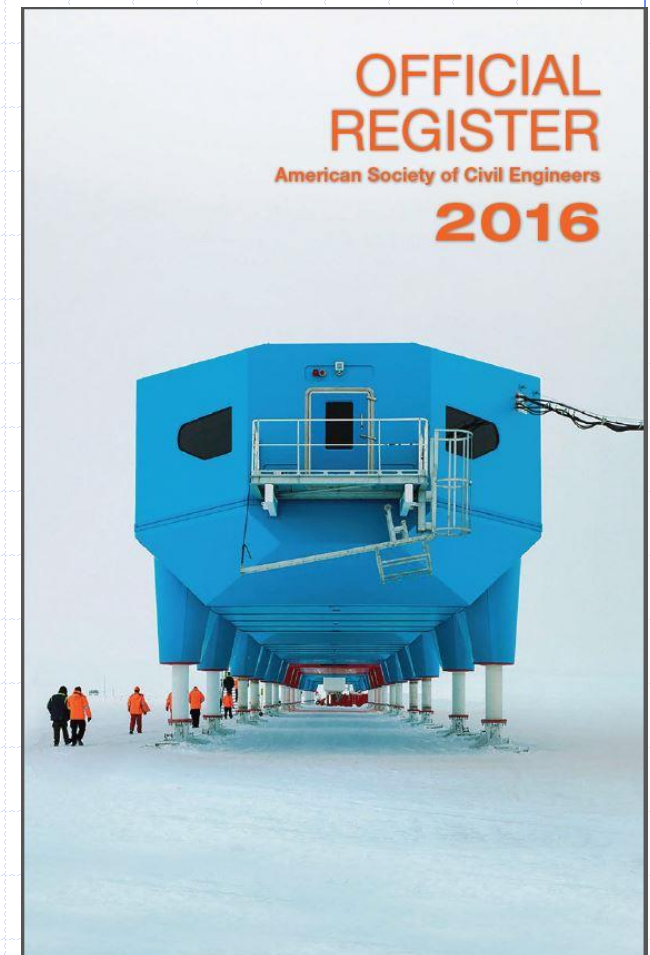


# Education Committee

## Current Projects:

Failure Case Studies Series –  
Steel Structures

Failure Case Studies Series –  
Concrete Structures

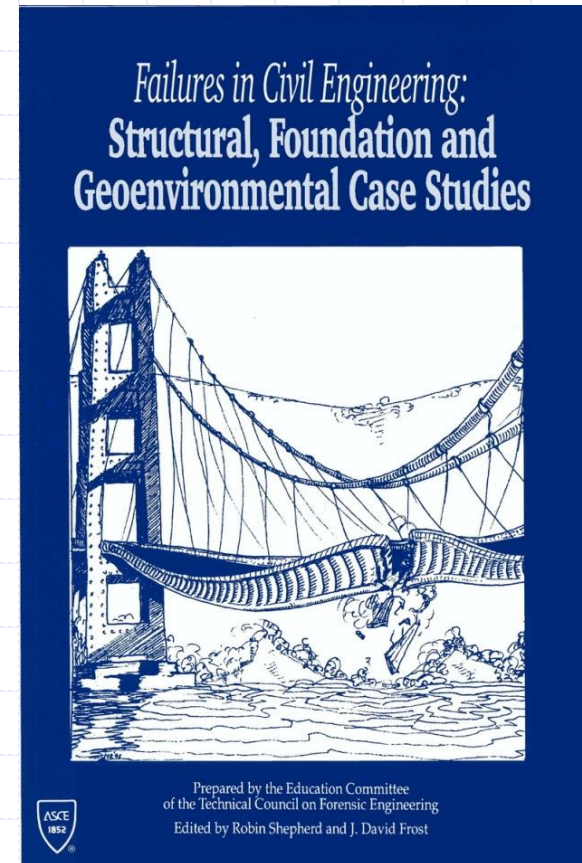




# Dissemination of Failure Information Committee

## Mission:

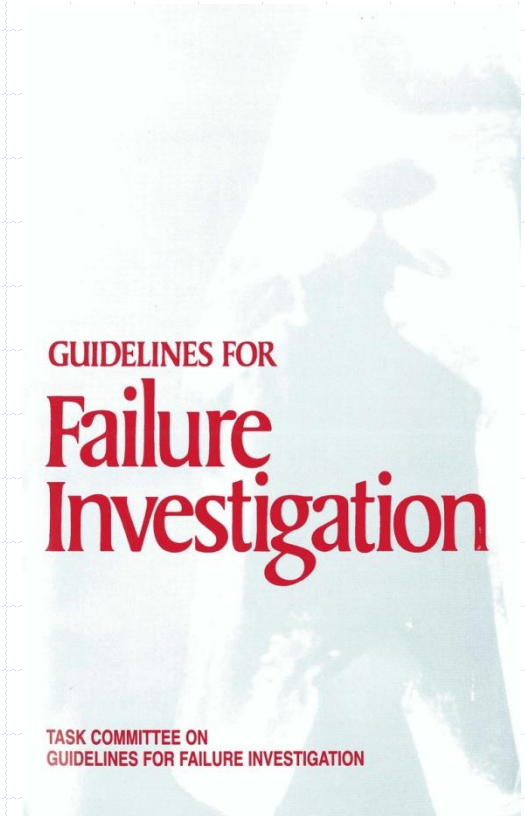
Develop and implement means for collecting and disseminating information regarding the nature and causes of failures of constructed facilities. In addition, to coordinate and assist in the collection and dissemination of failure information generated by other organizations, within and from outside ASCE.



# Forensic Investigations Committee

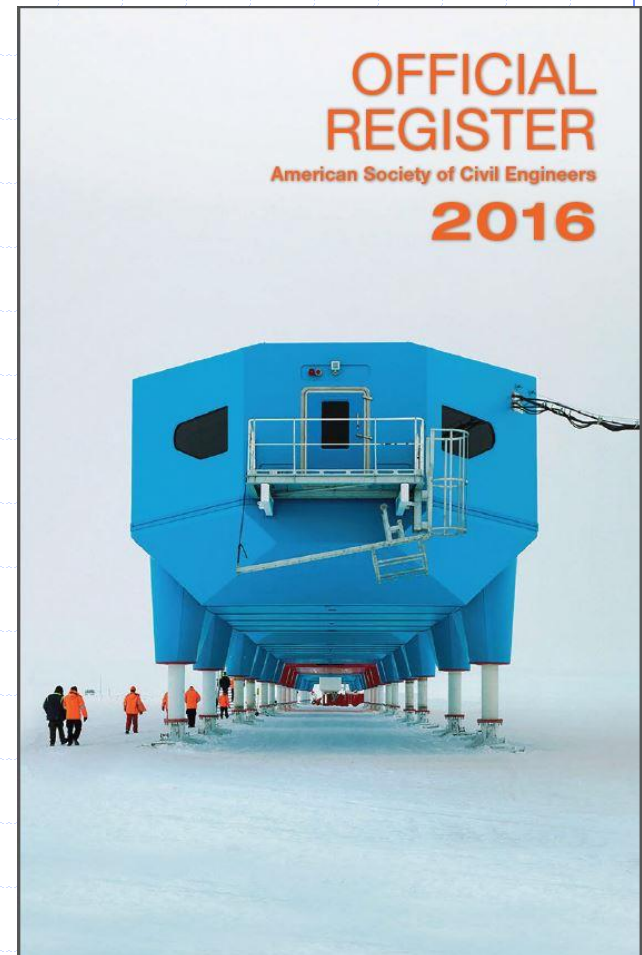
## Mission:

Identify needs related to the investigation of failures of constructed facilities, define the problems related to the methods and process of failure investigation and develop resources for practitioners to address those needs and problems.



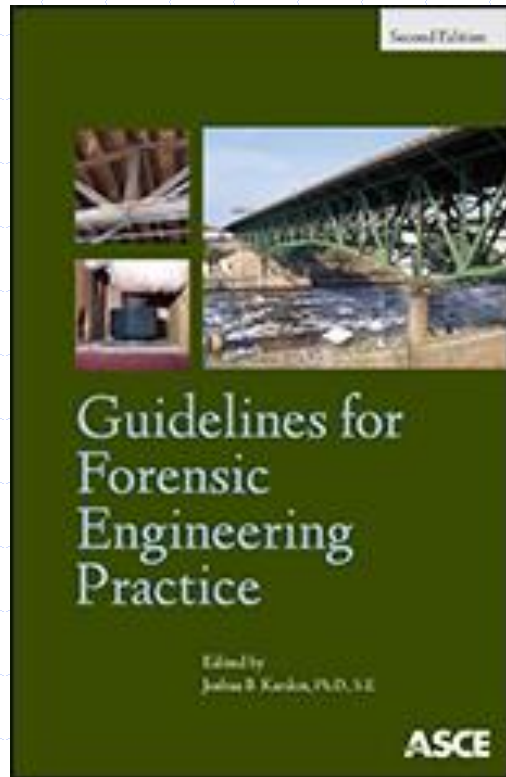
# Forensic Practices Committee

“The mission of the Forensic Practices Committee is to enhance the *competent and ethical practice* of Forensic Engineering. The Committee develops practice guidelines, seminars and conference sessions aimed at elevating the understanding of professionals engaged in the investigative and judicial arenas.”





# “Guidelines for Forensic Engineering Practice 2<sup>nd</sup> Edition”



## Chapters

1. Introduction
  2. Competencies and Qualifications of Forensic Engineers
  3. The Standard of Care
  4. Investigations and Reports
  5. Ethics
  6. The Legal Forum
  7. The Business of Forensic Engineering
- Summary

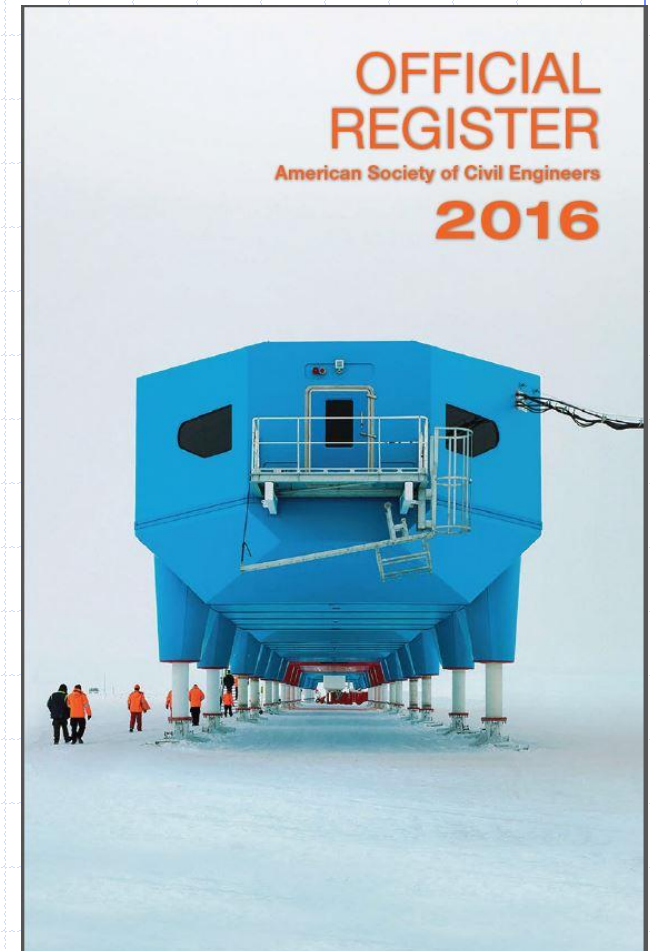
## Appendix

ASCE Code of Ethics

# International Activities Committee

## Mission:

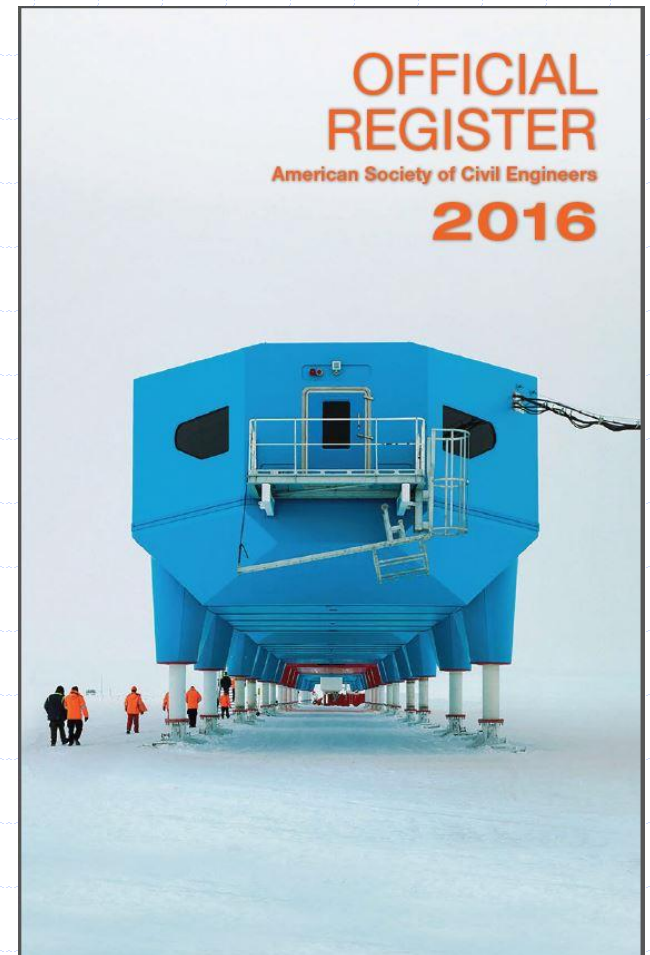
International Activities Committee will coordinate international outreach activities of the Forensic Engineering Division (FED), including liaison with forensic engineering organizations in other countries and organizing international forensic conferences and symposia.



# International Activities Committee

## Accomplishments:

International delegations to  
ICE/UK, Italy, India, China,  
Costa Rica, Ecuador,  
Guatemala

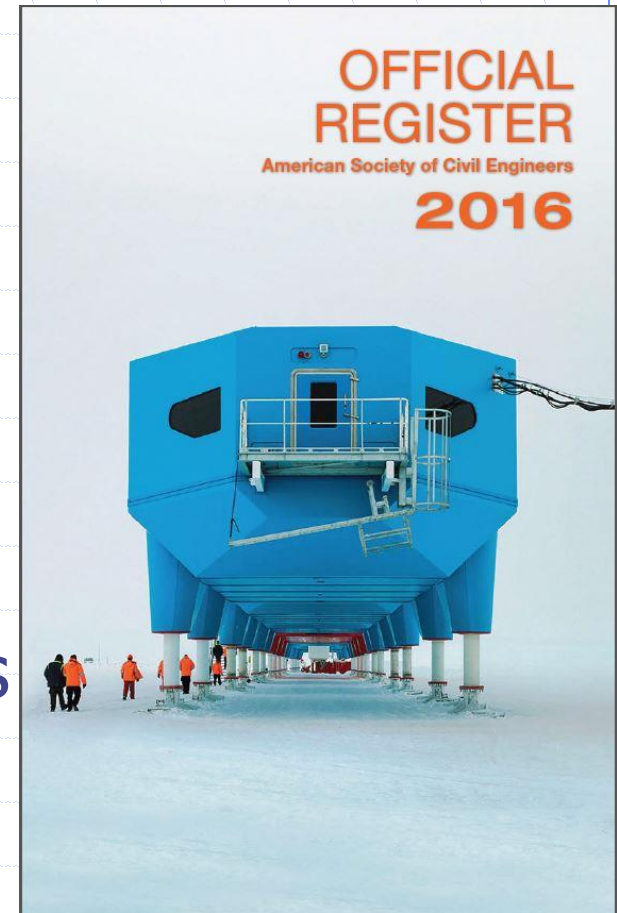




# Practices to Reduce Failures Committee

## Mission:

Develop objectives for change in the design and construction industry specifically targeted to reducing the incidence and severity of failures in civil engineered projects. To pursue implementation of these changes and to act as liaison between ASCE and other professional societies and organizations to pursue the prevention of failures.



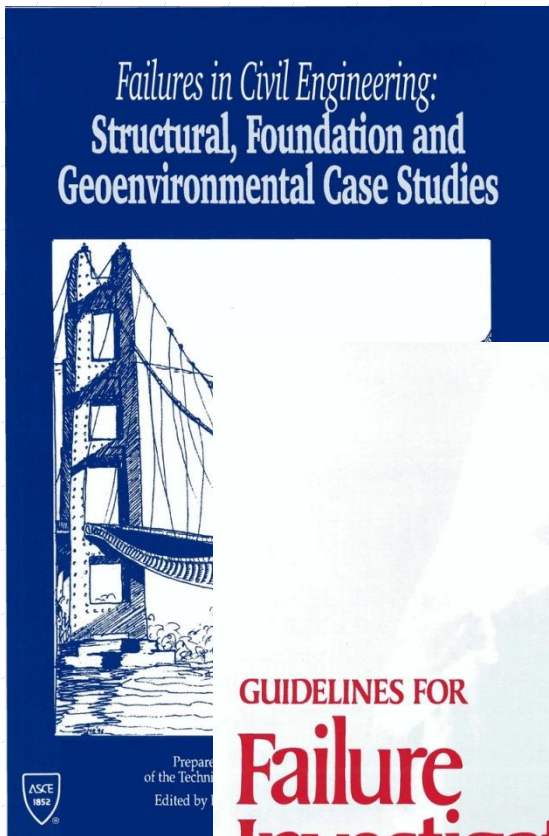
# Publications Committee

## Mission:

Review manuscripts, technical notes and discussions submitted to the Division for publication in the Journal of Performance of Constructed Facilities and to be responsible for the publication of papers sponsored by the Division.

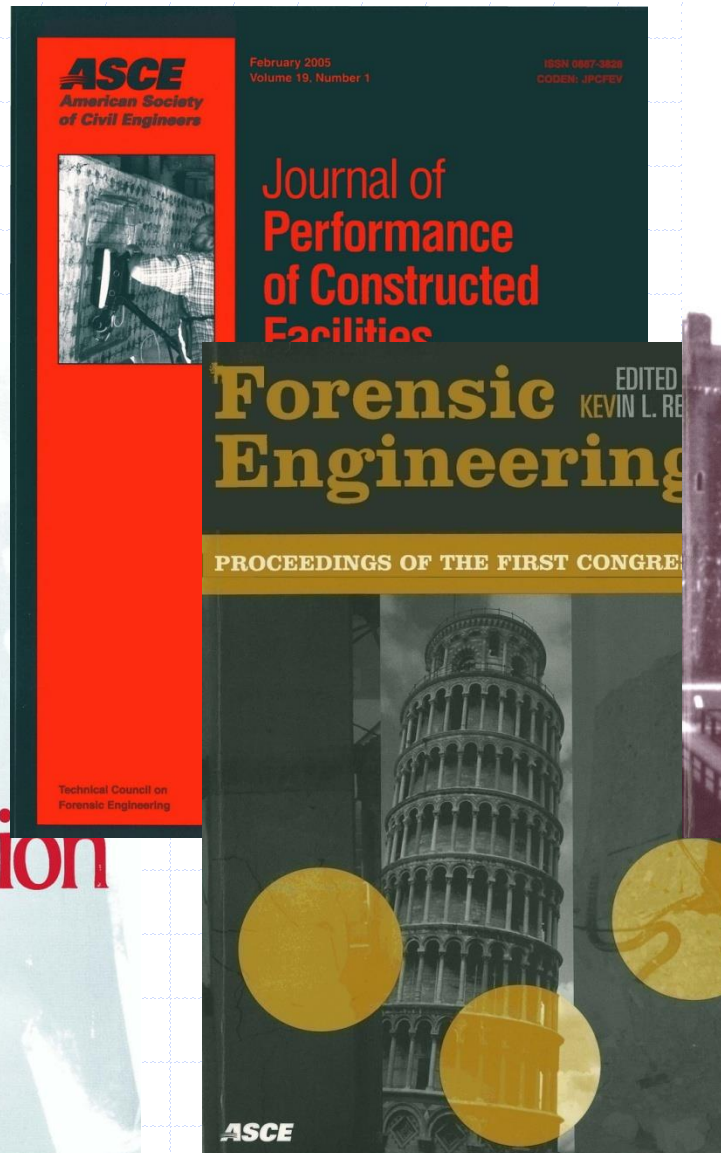


# FED Publications



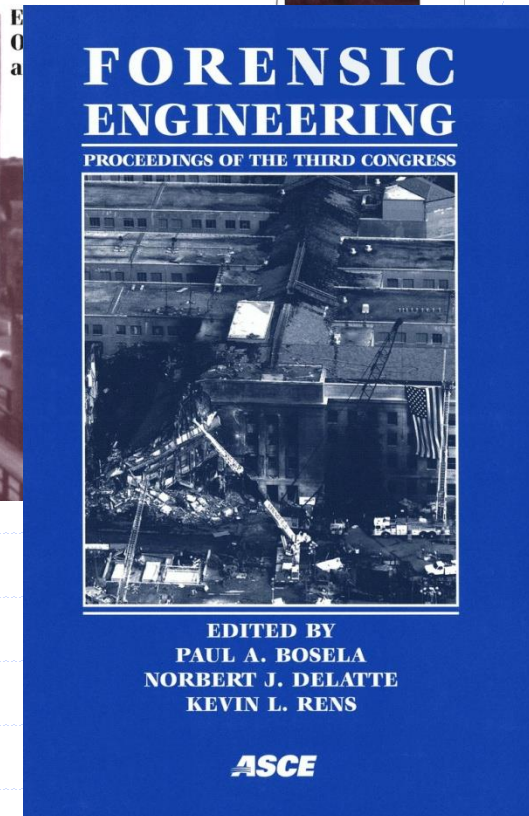
GUIDELINES FOR  
**Failure  
Investigation**

TASK COMMITTEE ON  
GUIDELINES FOR FAILURE INVESTIGATION



*Proceedings of the  
Second Congress*

**Forensic  
Engineering**





# Books



## Beyond Failure

