



Код: 10473

Niall F. MacAlevey

Structural Engineering Failures: lessons for design

2012 год

2860 стр; формат: 25,5 x 20,5 см; библиографический список: 121 единица
ISBN: 978-1453745779

Collapse is every structural engineer's biggest fear. Fortunately not every engineer must go through the experience of a collapse first-hand: we can all learn from the mistakes of others. In fact, it has been said that the only way in which we can prevent structural engineering failures is by more education. This is the purpose of this book.

We can learn least from structural engineering successes, as these structures are not tested. Structural failures, on the other hand, are full-scale tests. If something goes wrong it is essential that the failures are studied so that the true circumstances of the failure (and thus the nature of the test) established so that we can learn what not to do next time.

Fifty case studies of the failure of Civil Engineering Structures throughout the world are presented. These case studies are grouped into several chapters each containing case studies on a particular topic. The divisions are arbitrary and purely for organizational reasons. Lessons are drawn from each case study.

By preparing this book I hope encourage engineers to do the following:

Design structures that are more resistant to collapse.

Avoid making the same mistakes other engineers made in the past.

See the importance and limitations of checking and of codes of practice.

Be aware of danger signals.

See how preventable failures are.

Learn more about engineering judgement.

Encourage a more reflective approach among designers so they don't just apply the code blindly.

See the relationship between analysis and design.

Ключевые слова:

Содержание.

1. Introduction /
 - 1.0 Failures. /
 - 1.1 Progressive Collapse. /
 - 1.2 Ductile and Brittle. /
 - 1.3 Statical determinacy. /
 - 1.4 Code approach. /
 - 1.5 Tied solution. /
2. Gravity /
 - 2.1 Walkways at Hyatt Regency Hotel, Kansas, USA, 1981. /
 - 2.2 Hotel New World, Singapore, 1986. /
 - 2.3 Sampoong Department Store, Seoul, Korea, 1995. /
 - 2.4 Terminal 2, Paris Airport (Charles de Gaulle), France, 2004. /
3. Computers & Modelling /
 - 3.1 Hartford Civic Centre, Connecticut, USA, 1978. /
 - 3.2 Sleipner A offshore platform, Norway, 1991. /
 - 3.3 Ramsgate Walkway, Port of Ramsgate, UK, 1994. /
 - 3.4 Compassvale School, Singapore, 1999. /
4. Wind /
 - 4.1 Tay Bridge, Scotland, 1879. /
 - 4.2 Tacoma Narrows Bridge, Washington, USA, 1940. /
 - 4.3 Ferrybridge Cooling Towers, Pontefract, UK, 1965. /
 - 4.4 John Hancock Tower, Boston, USA, 1972. /
 - 4.5 Citicorp Centre, New York, USA, 1978. /
5. Maintenance /
 - 5.0 Introduction /
 - 5.1 Point Pleasant Bridge, Ohio/West Virginia, USA, 1967. /
 - 5.2 Mianus River Bridge, Connecticut, USA, 1983. /

- 5.3 Antioch School, California, USA, 1980. /
- 5.4 Ynys-y-Gwas Bridge, West Glamorgan, Wales, UK, 1985. /
- 5.5 Schoharie Creek River Bridge, New York, USA, 1987. /
- 5.6 Piper's Row car park, Wolverhampton, UK, 1997. /
- 5.7 De La Concorde Overpass, Montreal, Canada, 2007. /
- 6. Welding /
 - 6.0 Introduction. /
 - 6.1 King's Street Bridge, Melbourne, Australia, 1962. /
 - 6.2 Brooklyn College, New York, USA, 1971. /
 - 6.3 Alexander Kielland, Norway, 1980. /
 - 6.4 SMRF, Northridge, California, USA, 1994. /
- 7. Construction /
 - 7.1 Quebec Bridge, Quebec, Canada, 1907. /
 - 7.2 West Gate Bridge, Melbourne, Australia, 1970. /
 - 7.3 Bailey's Crossroads Condominium, Virginia, USA, 1973. /
 - 7.4 Willow Island Cooling Tower, West Virginia, USA, 1978. /
 - 7.5 Cocoa Beach Condominium, Florida, USA, 1981. /
 - 7.6 L'Ambiance Plaza condominium, Connecticut, USA, 1987. /
 - 7.7 MRT temporary works, Singapore, 2004. /
- 8. Fire, Explosion, and Impact /
 - 8.1 Ronan Point, London, UK, 1968. /
 - 8.2 Sunshine Skyway Bridge, Florida, USA, 1980. /
 - 8.3 Abbeystead Valve House, Lancashire, UK, 1984. /
 - 8.4 Alfred Murrah Building, Oklahoma, USA, 1995. /
 - 8.5 World Trade Center 1&2, New York, USA, 2001. /
 - 8.6 The Pentagon, Arlington, USA, 2001. /
 - 8.7 World Trade Centre 7, New York, USA, 2001. /
- 9. Cladding /
 - 9.1 Amoco Tower, Chicago, USA, 1989. /
 - 9.2 HKH A apartment blocks, Hong Kong, China, 1992. /
 - 9.3 Condominium Building, Singapore, 1993. /
 - 9.4 "Big-dig" tunnel, Boston, USA, 2006. /
- 10. Miscellaneous /
 - 10.1 US air force warehouses, Ohio/Georgia, USA, 1955/6. /
 - 10.2 Stepney School, London, UK, 1974. /
 - 10.3 Kemper Memorial Arena, Kansas, USA, 1979. /
 - 10.4 Shopping Centre, Burnaby, British Columbia, Canada, 1988. /
 - 10.5 Koror-Babeldaup Bridge, Palau, 1996. /
 - 10.6 Millennium Bridge, London, UK, 2000. /
 - 10.7 I-35W Bridge, Minneapolis, USA, 2007. /
 - 10.8 D. L. Lawrence Convention Centre, Pittsburgh, USA, 2007. /
- 11. Conclusions /
- Worked Examples /
- References /
- Appendix 1 /
- Appendix 2 /
- Index of cases /