

**INTRODUCTION**

In 2003, after the space shuttle *Columbia* disintegrated while reentering the Earth’s atmosphere, civil engineer Henry Petroski wrote a short essay for *The New York Times*. Petroski described how engineers factor the potential of failure into their work. As he described it, “[T]he way engineers achieve success in their designs is by imagining how they might fail” (Petroski, 2003).

**ASSIGNMENT GUIDELINES**

In this 1000-1250 word essay, you will analyze a specific structure or system and how it failed. You may choose any subject that meets the expectations of the assignment. To get started, consult [Engineering Case Studies Online](#), which is a database with resources about many structural failures. You may also choose from among the topics in the first list:

Hartford Civic Center, 1978	Sewol Ferry, 2014
Oakland Bay Bridge, 1989	Sampoong Superstore, 1995
Autoroute 19 de la Concorde Overpass, 2006	Falls View Bridge, 1938
Sando Arch Bridge, 1939	St. Francis Dam, 1928
Oklahoma City Murrah Federal Building, 1995	Peace River Bridge, 1957
Ashtabula Bridge, 1876	Antelope Valley Freeway, 1971 and 1994
L’Ambiance Plaza, 1987	Quebec Bridge, 1907
Charles de Gaulle Airport, 2004	Kemper Arena, 1979
Banqiao Reservoir Dam, 1975	Schoharie Creek Bridge, 1987

***Prohibited topics:***

<i>Rana Plaza Building, 2013</i>	<i>The Leaning Tower of Pisa, 1173</i>
<i>World Trade Center Attack, 2001</i>	<i>Tacoma Narrows Bridge, 1940</i>
<i>Hyatt Regency Walkway, 1981</i>	<i>I-35 Bridge, 2007</i>

Write an essay in which you do all of the following:

1. Explain for a non-engineering audience how and why the structure failed. Incorporate relevant statics concepts from class.
2. Discuss the ethical failure(s) that led to the structural collapse.
3. Reflect on the broader ethical implications of this disaster.
4. Include at least one figure (with citation and caption) that enhances your discussion.
5. Cite the Petroski article and at least two other credible sources (no Wikipedia).
6. Include a References page in APA format. Cite all references in the essay.

Here are some questions that may help you craft your essay:

- Did a design flaw involving insufficient consideration of moments, loads, and/or forces cause the structure to fail?
- Did the structure lack redundant safety mechanisms?
- Was the failure preventable?
- What steps could have been taken before the structure failed?
- What responsibilities do engineers face in the design and maintenance of structures?

## REQUIRED AND RECOMMENDED READING

You will also find these documents or links on the Hanson Center's Course Support page:

- "[Failure is Always an Option](#)," Henry Petroski (*Note: You must read and cite this article.*)
- National Society of Professional Engineers (NSPE) [Code of Ethics](#)
- [Model essays](#) from previous Statics classes
- [Engineering Case Studies Online](#)
- Case study of the [Tacoma Narrows bridge collapse](#) (*Note: You may not use this failure as the subject of your own essay.*)

## FORMAT AND SUBMISSION GUIDELINES

### Format

- Title page: Create an original title. Center and double-space. Include one line each for full title, your name, course name and section number, professor's name, and due date.
- Essay layout: double-spaced, 12 pt. Times New Roman font, 1 inch margins, page numbers.
- Length: 1000-1250 words (*Note: Both drafts must be this length to receive full credit.*)
- File Name: Last name, First name, Statics Course Section, Draft/Final (*Example: "Smith, Jane, 0BBB, Draft"*).

### Submission

- Submission type: Electronic, through the Canvas assignment module
- File type: .doc or .docx only

## SCHEDULE AND DEADLINES

Sept. 25 (Mon)	In-class visits by the Hanson Center to introduce the assignment.
Sept. 27 (Wed)	
<b>Oct. 18 (Wed)</b>	<b>First Draft due to Canvas by 4:00 p.m.</b>
Week of Oct. 30	First drafts returned online.
Sept. 26-Oct. 18 Nov. 1-Nov. 28	Schedule a 25-minute appointment with the Hanson Center. ( <i>Note: Appointments scheduled between Oct. 18-Nov. 1 will not count for credit.</i> )
<b>Nov. 29 (Wed)</b>	<b>Final Paper due to Canvas by 4:00 p.m.</b>
Week of Dec. 11	Final papers returned online.

Note: When you come to the HCTC for your appointment, bring a printed copy of your paper. If your draft has been evaluated, bring a printed copy of all feedback, as well.

**Late Policy:** Late work will not be accepted. Rare exceptions will be made for documented illnesses or emergencies on a case-by-case basis. Further information can be found at [https://registrar.uiowa.edu/sites/registrar.uiowa.edu/files/wysiwyg/uploads/reason\\_for\\_absence\\_from\\_class\\_1.pdf](https://registrar.uiowa.edu/sites/registrar.uiowa.edu/files/wysiwyg/uploads/reason_for_absence_from_class_1.pdf).

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**Questions? Visit the Hanson Center for Technical Communication**

**Location:** 2224 SC (in the Student Commons)

**Appointments:** Use our online schedule: <https://hanson.mywconline.com/>