

# ENGINEERING ETHICS

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# WHY ENGINEERING ETHICS?

- State laws and regulations for professional engineers often include ethics
- Employer rules for ethics and conflict of interest
- Professional society code of ethics
- Continuing education requirements

# EMPLOYER RULES

- Government employers
  - Ethics and conflict of interest rules
    - Sometimes more strict than professional rules
    - Avoid perception of conflict of interest
- Private employers
  - Extent of rules vary

# ASCE CODE OF ETHICS

First adopted in 1914

Uphold and advance the integrity, honor and dignity of the engineering profession

ASCE members required to abide by code of ethics and to report violations

Can be found at <http://www.asce.org/code-of-ethics/>

# ASCE CODE OF ETHICS

Seven canons:

1-Hold paramount the safety, health and welfare of the public

2-Perform work only in areas of competence

3-Issue public statements only in objective and truthful manner

4-Act as faithful agent of trustee for employer or client

5-Build professional reputation on merit of services

6-Act to uphold the honor, integrity and dignity of engineering profession

7-Continue professional development and provide opportunities for those under supervision to do so.

# CASE STUDIES

Taken from either:

Civil Engineering magazine, *A  
Question of Ethics*

Personal experience

# CASE STUDY 1

Providing scientific and technical info to public regarding probability of earthquake

Civil Engineering magazine, “A Question of Ethics”, April 2013

# CASE STUDY 1

## BACKGROUND

L'Aquila, Italy

Population-80,000

Seismically active area

Soil amplifies seismic waves

2009-Series of minor tremors

Local lab tech predicts major earthquake

Some residents take precautions



# CASE STUDY 1

## SITUATION

Government convenes special, 1 hr. meeting of:

*National Commission for Forecasting and Preventing Major Risks*

Conclusion-Such swarms of tremors are common and cannot be considered as predictors

Commission spokesperson

Situation completely normal & presents no danger.

Swarm is beneficial, allowing discharge of seismic energy.

Relax & have a glass of wine.

# CASE STUDY 1

## SITUATION

Six days later

6.3 magnitude earthquake occurs

309 people die

Seven scientists and engineers tried and convicted of manslaughter.

Judge ruled that they had voluntarily participated in a media campaign that gave public false sense of security.

# CASE STUDY 1

## ANALYSIS

Commission conclusion incomplete

Tremor swarm with medium-sized shock increases chances to 2%.

Spokesperson had no background in seismology

Hydraulic engineer

No one from commission corrected misstatements by spokesperson.

Minutes of commission meeting suggest purpose of meeting was to dismiss earthquake prediction.

Less precautions were taken after announcement.

# CASE STUDY 1

Is court decision justified?

# ASCE CODE OF ETHICS

Canon 1-Hold paramount the safety, health and welfare of the public

Canon 3-Issue public statements only in objective and truthful manner

3.b Engineers shall be objective and truthful in professional reports, statements and testimony. They shall include all relevant and pertinent information in such reports, statements, or testimony

# CASE STUDY 1

## ASCE POSITION

ASCE Structural Engineering Institute reaction

1. Public officials must be educated on ways to properly communicate uncertainties surrounding natural hazards.
2. Emergency preparedness and strict attention to building codes are essential to mitigate effects of tragedies.
3. Code of Ethics requires professionals to carefully convey opinions and do so in a truthful manner that properly acknowledges uncertainties in the data and methods used to support a conclusion.

# CASE STUDY 1

How could this scenario apply to us?

Differences between

Commission member

Consultant

Employee

# CASE STUDY 1

Additional thoughts?



# CASE STUDY 2

The need to act on safety issues observed during construction “observation.”

Civil Engineering magazine, “A Question of Ethics”, March 2016

Hypothetical situation based on *Carvalho v. Toll Brothers & Developers*, 143 N.J. 565 (1996)

# CASE STUDY 2

## BACKGROUND

Engineering firm designs sewer for city

Third party contracted to build sewer

Firm has authority to:

- Inspect the contractor's work

- Reject any work that fails to comply with the plans or specs

- Require the on-site employees and subcontractors to cease work

# CASE STUDY 2

## BACKGROUND

Contract also includes disclaimer:

The engineer “shall not have control over construction means, methods, techniques, or safety precautions.”

“The contractor alone shall be responsible for the safety, adequacy, and efficiency of his plant, equipment and methods.”

# CASE STUDY 2

## SITUATION

Engineer and ASCE member is assigned task of observing daily construction.

Contractor working in unshored trench 13' deep.

Use of shoring would have required cutting and restoring multiple utility lines

# CASE STUDY 2

## SITUATION

Unstable trench conditions have led to prior collapses at the site.

Water pooling at the bottom of the trench.

Engineer is aware of all of this.

Engineer takes no action.

Trench collapses and a worker is killed.

# CASE STUDY 2

## QUESTION

Is the engineer's actions a violation of ASCE Code of Ethics?

Question is limited to ethics, not legal liability

What do you think?

# CASE STUDY 2

## ANALYSIS

ASCE Policy 350-Construction site safety “requires attention and commitment from all parties involved.”

Standard contracts often assign responsibility for safety to one or more parties

Professional ethics often impose higher standards than legal requirements

# CASE STUDY 2

## ASCE POSITION

Engineer's ethical obligation to "hold paramount the safety, health and welfare of the public" is not limited to situations in which a duty is imposed by contract or by law.

Engineer was aware of dangerous site conditions and failed to take appropriate action.

This is a violation of Code of Ethics, Canon 1



# CASE STUDY 2

## LEGAL RESULT

Court held that engineering firm had sufficient authority to halt work and insist on safe construction practices.

Since the firm's representative could foresee the dangers and had the authority to mitigate them, the firm had violated its duty of care and was legally liable.

# CASE STUDY 2

## QUESTION

Would the ethical requirement be different if the engineer was not in an official observation role?

Question is limited to ethics, not legal liability

What do you think?

# CASE STUDY 2

Additional thoughts?