

Ethics

Assuming that you are now at the junction near Austin Road and Cheong Wan Road.

The pedestrian RED light is being displayed now and under the following three scenarios,



WILL YOU CROSS THE ROAD?

(A)

(A) there is no coming vehicles BUT there is a Traffic Police around,

(B)

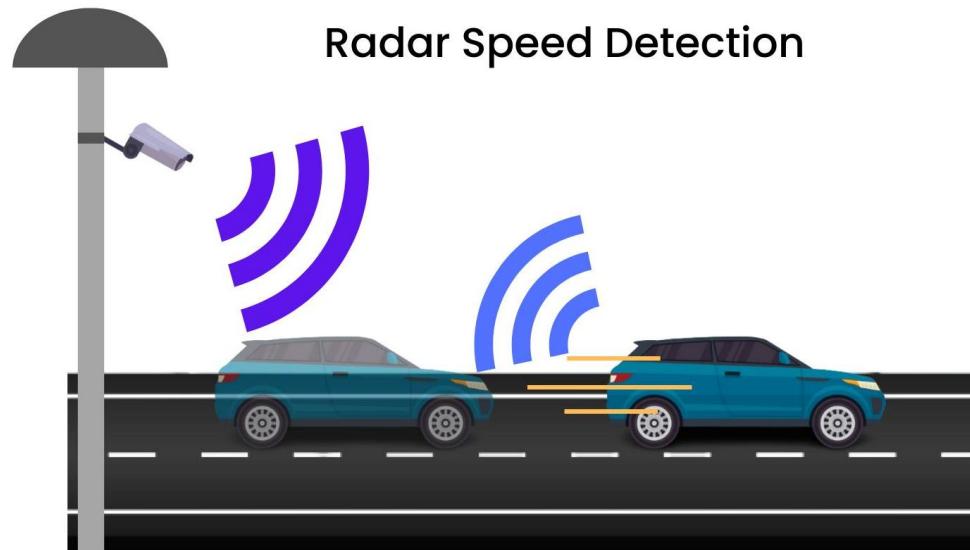
(B) there is no coming vehicles and there is no Traffic Police around, you are NOT in a hurry;

(C)

(C) there is no coming vehicles, there is no Traffic Police around, BUT you are in a great hurry to come back to PolyU campus for a mid-term test.

Engineering Ethics

An engineer with a firm specializing in electronics manufacturing is asked by management to design and develop a new generation of **radar detectors** for private consumption. The newest generation of “stealth” detectors is to **alert drivers to the presence of police radar and laser traps while at the same time “cloaking” use of the detectors.**



Engineering Ethics

Now, let us suppose our engineer has misgivings about developing such a device. His reasoning is as follows: Radar detectors, as the name implies, are most often used by drivers to detect “radar”. Radar is any of a group of electronic devices used by the highway patrol to gauge the speed of traffic on the roadways.

Drivers generally use such detectors to **alert** them to the use of radar. Because radar detectors are **used by** drivers primarily to **exceed posted speed limits**, which is an **illegal act**, some states have made their use illegal.

Engineering Ethics

Thus, in order to discover the use of “illegal” radar detectors, law enforcement officers employ electronic devices designed to detect the use of radar detectors. The device that our engineer is being asked to develop is one that will alert the users that such **counter-measures** are being used without it being detected.

Engineering Ethics

Now, imagine further that our engineer believes that speed limits are a **reasonable** limitation on **personal freedom** because they help secure the **safety** of other persons traveling on or nearby the roadways, such as pedestrians or the drivers and occupants of other vehicles. Let us also suppose our engineer believes that the device he is being asked to develop will be used almost exclusively to break what he considers to be just laws. Troubled, **he expresses his concerns to management.**

Engineering Ethics

Management tells our engineer that there are **significant profits** in such a device and that he should get to work on the project or find another job. The **dilemma** for our engineer, then, is whether to serve his own and his employers' interests by doing what he is told and, thereby, keep his job or serve the public interest by refusing to participate in the development of a device that will help enable activities that are a threat to **public safety**.

Engineering Ethics

Similar **dilemmas** could face engineers being asked to cover-up, ignore or under-report the existence of toxic wastes, structural defects, design flaws, or any other potential health or safety hazards.

What is the “right” thing to do?

Engineering Ethics

There are many ways to consider the question, “What is the right thing to do?”

From an **economic perspective**, the right thing to do is whatever is the most profitable.

From a **personal interest perspective**, the right thing to do is whatever maximizes one's own well being.

Religious perspectives

Political perspectives

Social perspectives

Engineering Ethics

We want to know what is the **morally correct**, or right, thing to do when faced with situations involving questions of right and wrong, **good and evil**, virtue and vice.

Engineering Ethics

In contemporary literature, the term “ethics” often refers to reflective and theoretical perspectives of right and wrong, what dictionaries call “moral philosophy.” It also refers to the system or code of morals practiced by a particular person, group, or profession.

Engineering Ethics

In their broadest and most familiar meaning, **ethics** (**morality**) are concerned with many forms of belief about good and bad, right and wrong, appropriate and inappropriate human behavior, rights, virtue, and vice. **Ethics and morality** are studies of what we *ought* to do and how we *ought* to behave from a moral viewpoint, as opposed to an economic, religious or political viewpoint.

Engineering Ethics

Another example:

If I want to get to an important interview on time, it might be prudent for me to exceed the speed limits as I drive to my appointment.

I *ought*, in this case, to speed.

However, if it's morally wrong to *speed*, then the moral thing to do is *not speed*.

Engineering Ethics

The kinds of situations that are particularly challenging in ethics are those that involve an **ethical dilemma**.

An **ethical dilemma** exists whenever moral reasons or considerations can be offered to support two or more opposing courses of action. For example, respect for individual self-determination could be offered as a moral reason to support a person's decision not to wear seatbelts while respect for the value of human life might be used to support mandatory seatbelt laws.

Ethical Dilemma

Euthanasia (安樂死):

the painless killing of a patient suffering from an incurable and painful disease or in an irreversible coma. The practice is illegal in most countries.

Principle of autonomy:

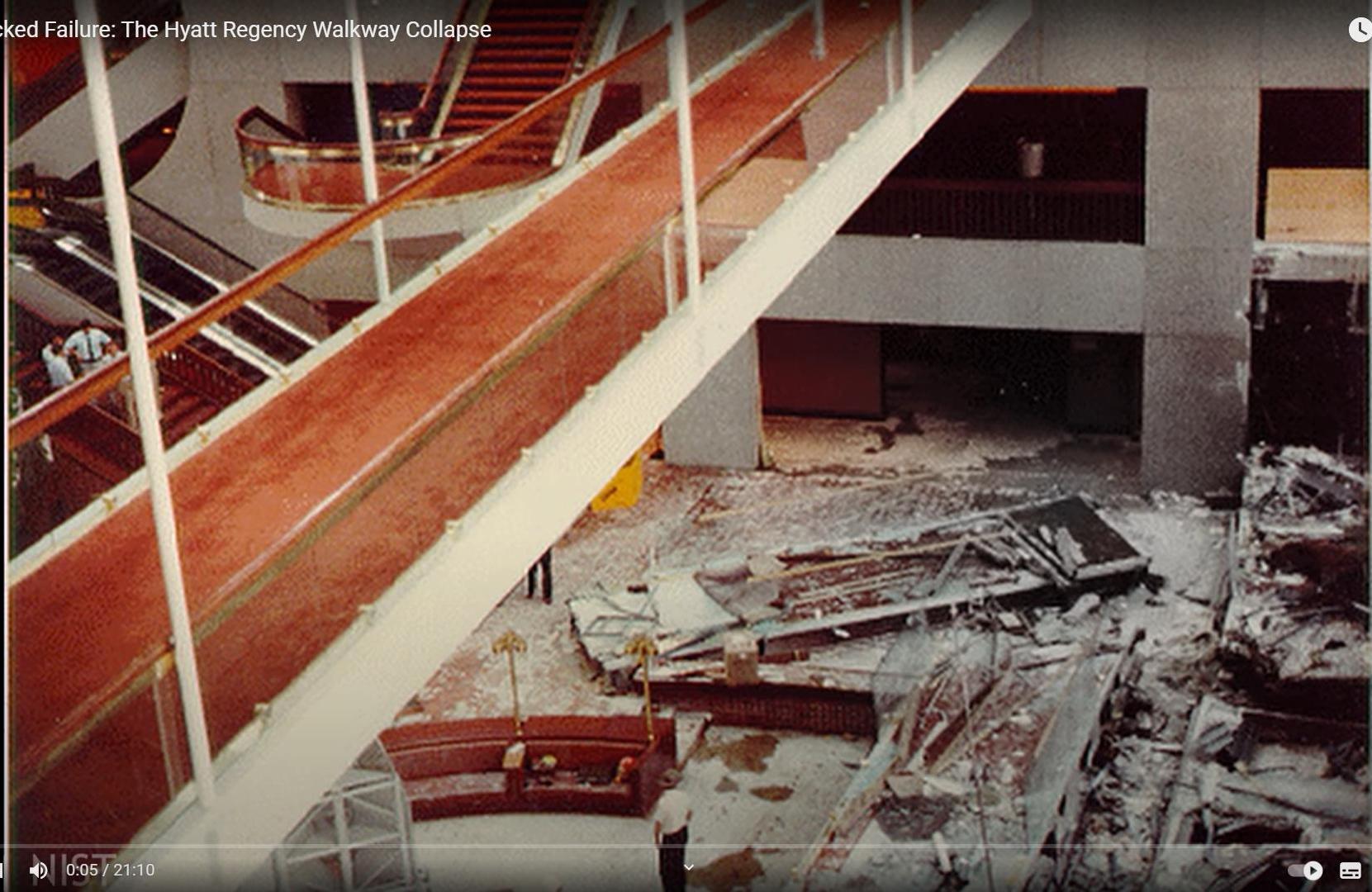
According to this principle, the actions and decisions of autonomous persons ought to be respected.

Case Study:

The Hyatt Regency Kansas City Hotel Walkway Collapse

<https://www.youtube.com/watch?v=jgG-gnpn0os>
https://www.youtube.com/watch?v=lilU_gggqoM

Fast-Tracked Failure: The Hyatt Regency Walkway Collapse



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NBS NIST

0:05 / 21:10

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17

Fast-Tracked Failure: The Hyatt Regency Walkway Collapse



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0:16 / 21:10



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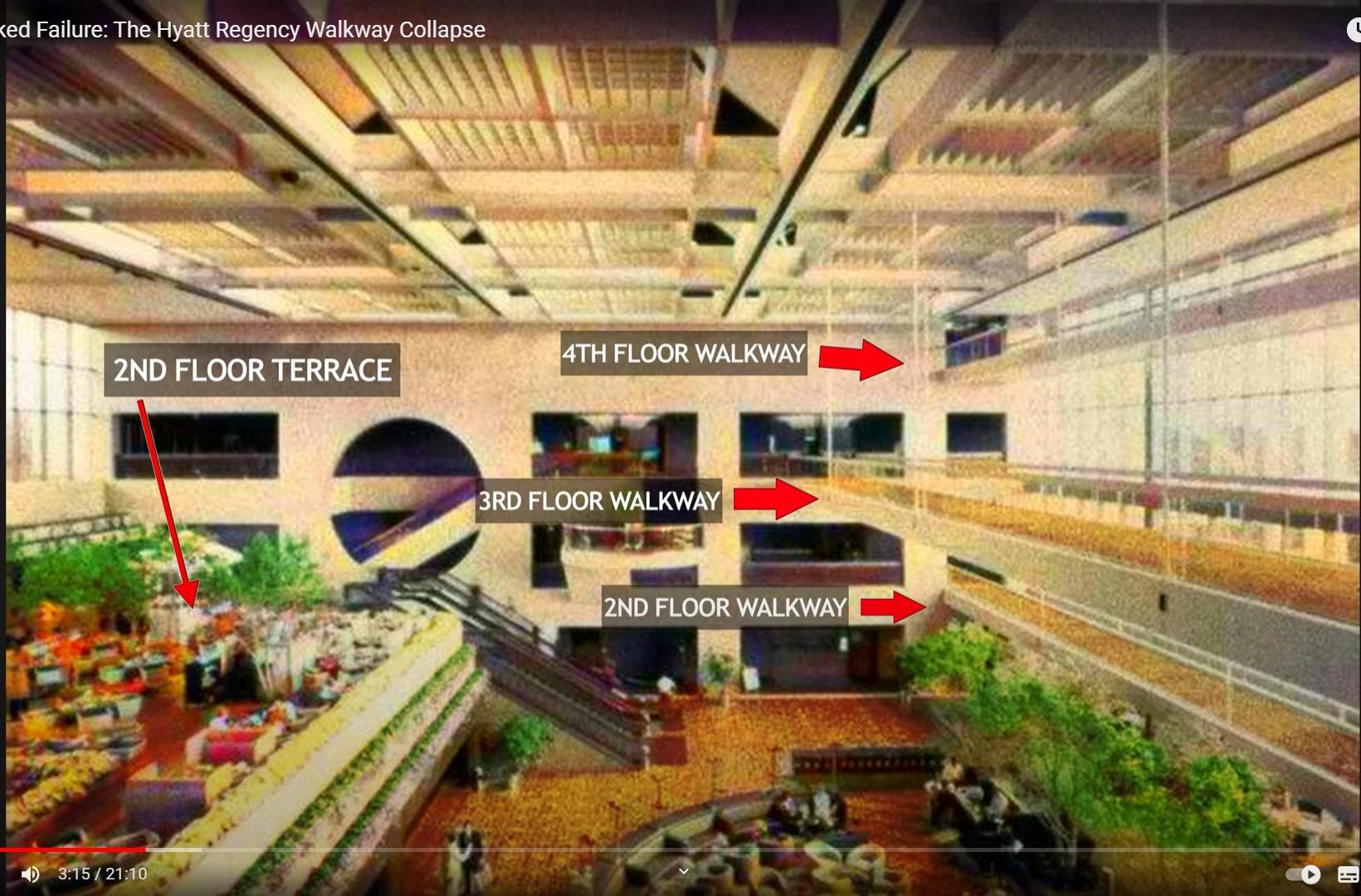
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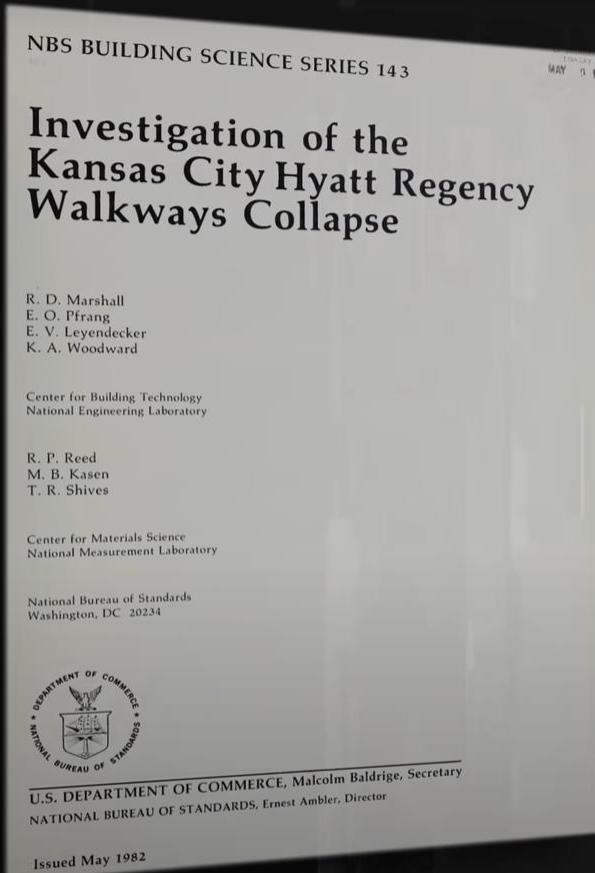
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NIST

**National Institute of
Standards and Technology**
U.S. Department of Commerce

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Fast-Tracked Failure: The Hyatt Regency Walkway Collapse



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SPAN POSITIONS AT TIME OF COLLAPSE

7-8

8-9

9-10

10-11

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HYATT REGENCY

45 STORIES - 750 ROOMS

CONSTRUCTION START: SPRING 1978

DEVELOPER & OWNER:

HALLMARK INC / CROWN REDEVELOPMENT

CONSULTATION & DESIGN:

JACK D. GILLUM (PRINCIPAL)

GILLUM-COLACO CONSULTANTS

(LATER KNOWN AS GCE INTERNATIONAL INC)

ENGINEERING SERVICES:

DANIEL M DUNCAN (PRINCIPAL)

PBNDML INC.

(PATTY BERKEBILE NELSON DUNCAN MONROE LEFEBVRE)



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(LATER KNOWN AS GCE INTERNATIONAL INC)

SUBCONTRACTOR & STEEL FABRICATOR:
HAVENS STEEL COMPANY



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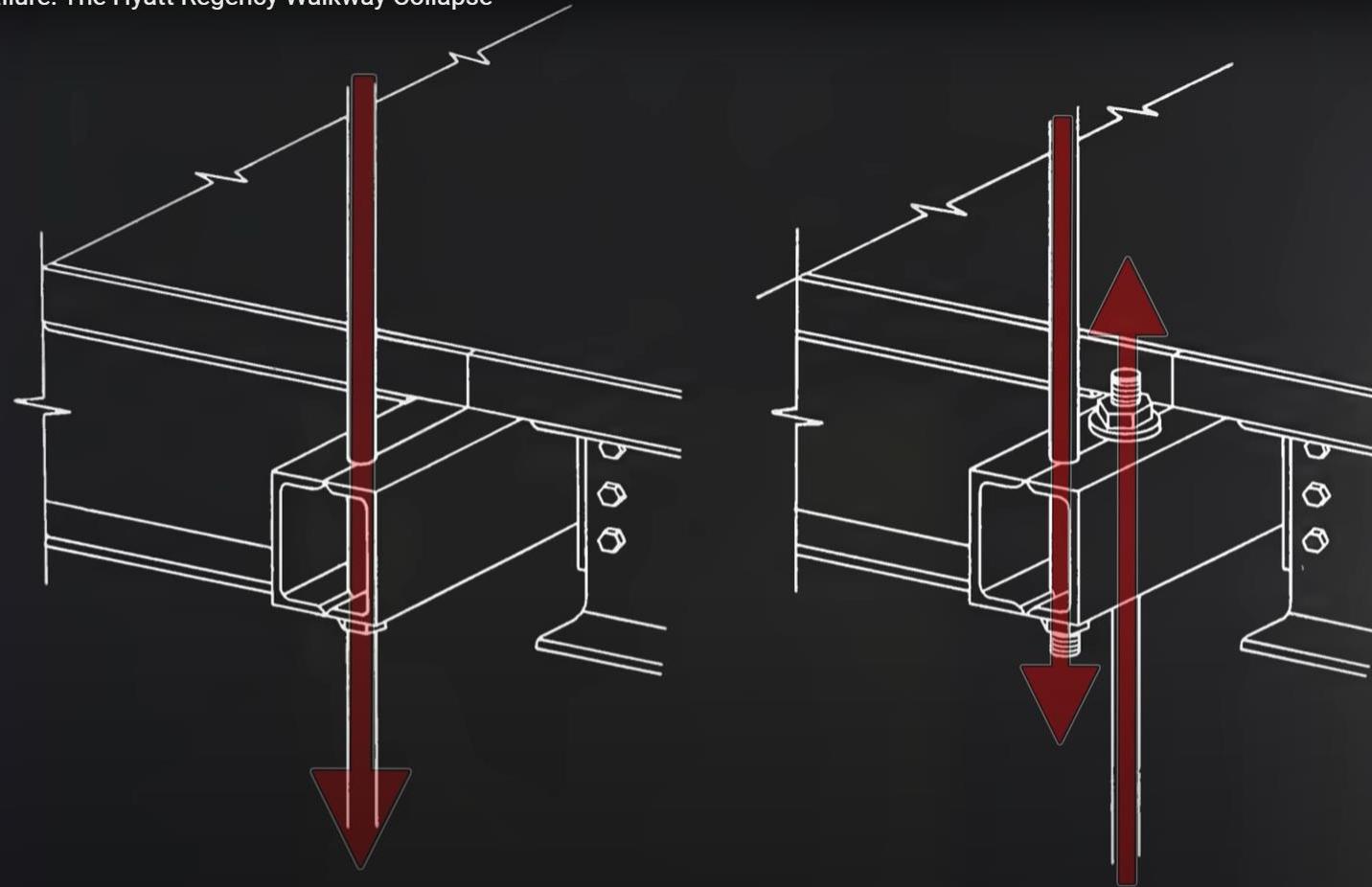


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26

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~~ORIGINAL DESIGN~~

REVISION REQUESTED BY HAVENS

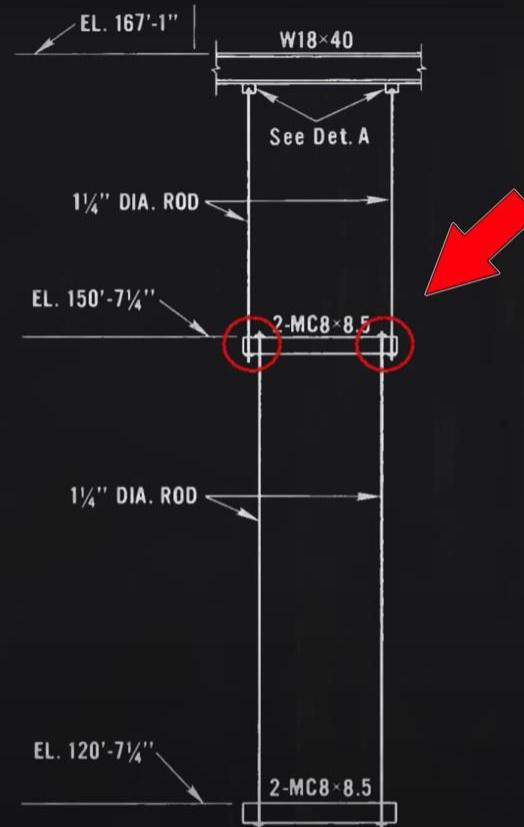
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Fast-Tracked Failure: The Hyatt Regency Walkway Collapse

4TH FLOOR WALKWAY



2ND FLOOR WALKWAY



播放 (k)

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~~ORIGINAL DESIGN~~

REVISION REQUESTED BY HAVENS



4TH FLOOR WALKWAY
ORIGINAL DESIGN

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4TH FLOOR WALKWAY REVISED & AS BUILT

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CROSS SECTION OF ORIGINAL DESIGN

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4TH FLOOR WALKWAY

ORIGINAL DESIGN

2ND FLOOR WALKWAY

EACH FLOOR
HELD INDEPENDENTLY



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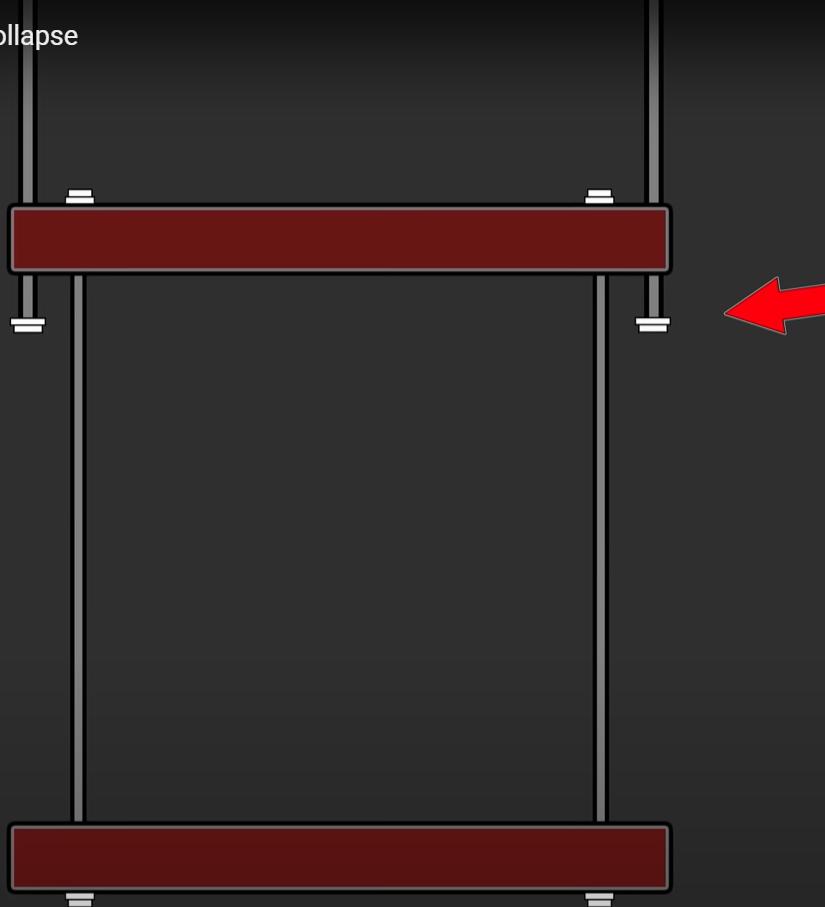
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4TH FLOOR WALKWAY

4TH FLOOR
LOWER NUT

REVISED / AS BUILT

2ND FLOOR WALKWAY

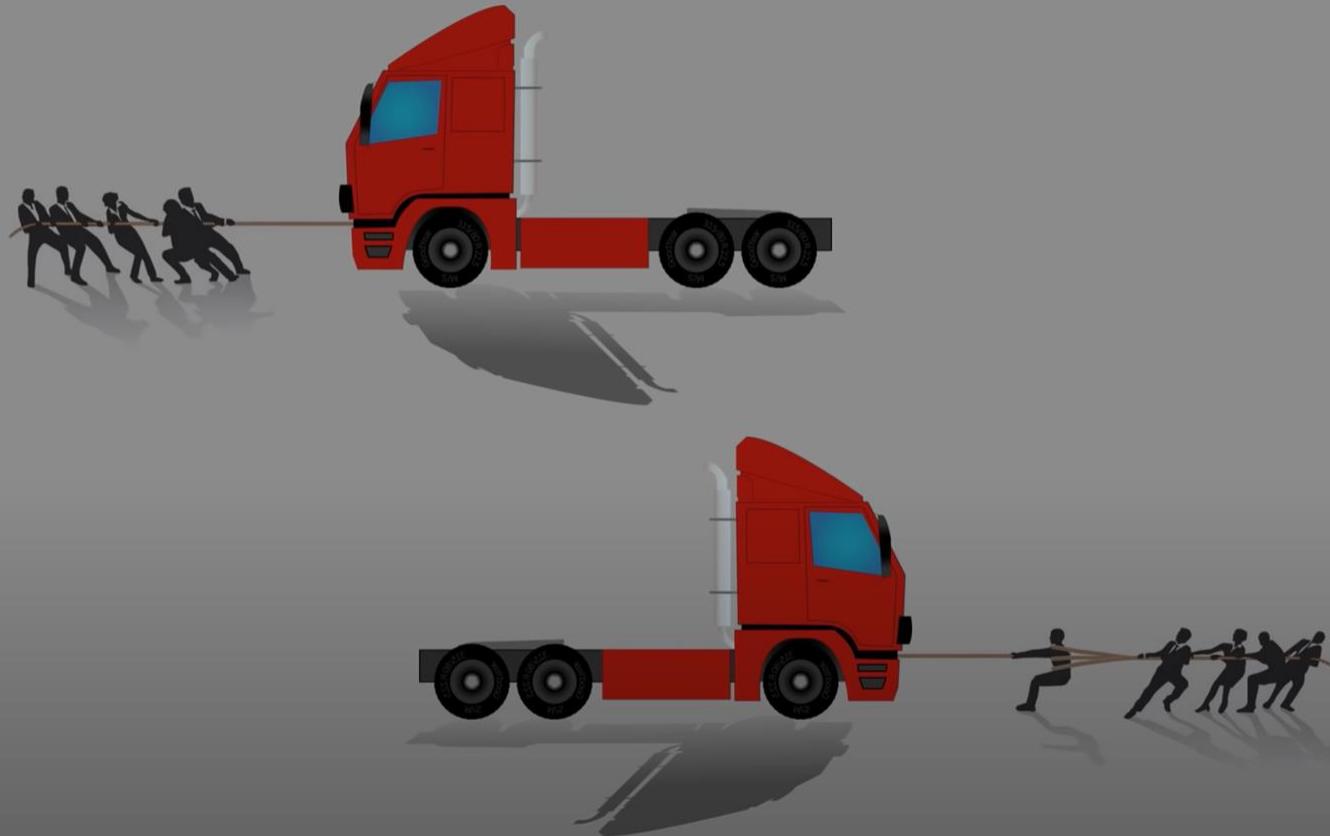


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Fast-Tracked Failure: The Hyatt Regency Walkway Collapse



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Figure 5.7 Hanger rod pull-through at location 9UE.



Figure 5.8 End view of box beam at location 9UE

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14:20 / 21:10

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3RD FLOOR WALKWAY

SINGLE WALKWAY
USED ORIGINAL DESIGN

播放 (k)

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Figure 6.36 Walkway deformed shapes.

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17:58 / 21:10

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Skywalk Memorial dedicated to victims of the collapse unveiled in Kansas City

305 views • Nov 12, 2015



41 Action News
KSHE

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One of the darkest days in Kansas City's history was remembered Thursday with the dedication of a memorial.

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FEREs

Fundamental Ethical Responsibilities of Engineers (FEREs)

(FERE1): *to not cause harm or an unreasonable risk of harm to others (or the public interest)*

(FERE2): *to try to prevent harm and any unreasonable risk of harm to others*

(FERE3): *to try to alert and inform about the risk of harm those individuals and segments*

(FERE4): *to work to the best of their ability to serve the legitimate interests of their employer or client*

Reference

Kenneth K. Humphreys, *What Every Engineer Should Know about Ethics*, 1st Edition

Robert McGinn, *The ethical engineer : contemporary concepts and cases*, 2018

