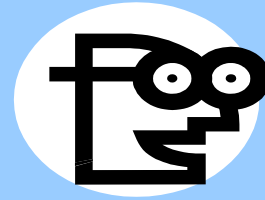
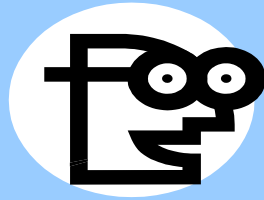
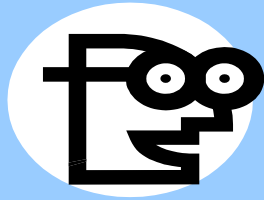




E 401 Civil Engineering Seminar

General Questions:



It's QUESTION TIME !!



CE 401 Civil Engineering Seminar Essay Teams

•SECTION 1 ESSAY TEAMS

ESSAY TEAMS - SECTION 1	
Last Update	2-Person Teams 0
1/27/2023 9:52	
Unassigned Students	AMBER
Student Formed Teams	BLACK
Assigned Teams	RED
Narasimha	101
Stevenson	101
Arnieri	102
Berling	102
Lemons	103
Ohlmann	103
Rice	104
Spencer	104
Abanto	105
Anthony	105
Hale	106
Wallin	106
Hubbard	107
Elias	107
Morrison	108
Holland	108
Konecny	109
Popham	109
Browning	110
McKean	110
Januski	111
Delaney	111
Holbrook	112
Fonseca	112



CE 401 Civil Engineering Seminar

Failures-Hyatt

•WEEK 3: DISCUSSION GROUP ACTIVITY

Timely Initial Posts: 94.4%			Last Update 27-Jan-23 9:52 AM				
Section 1			Week 3 Discussion Question Activity Report				
Question	Group	Leader	1	2	3	4	5
1	A	Januski	Browning	Delaney	Januski	McKean	
1	B	Hubbard	Arnieri	Berling	Elias	Hubbard	
1	C	Konecny	Konecny	Lemons	Ohlmann	Popham	
1	D	Wallin	Abanto	Anthony	Fonseca	Wallin	
1	E	Spencer	Narasimha	Rice	Spencer	Stevenson	
1	F	Morrison	Hale	Holbrook	Holland	Morrison	
2	A	Delaney	Browning	Delaney	Januski	McKean	
2	C	Lemons	Konecny	Lemons	Ohlmann	Popham	
2	E	Narasimha	Narasimha	Rice	Spencer	Stevenson	
3	B	Arnieri	Arnieri	Berling	Elias	Hubbard	
3	D	Fonseca	Abanto	Anthony	Fonseca	Wallin	
3	F	Holbrook	Hale	Holbrook	Holland	Morrison	

Font Legend			
non-bold	No post made, time for posting remains	non-bold	Late Post before consensus, 20% loss
Bold	Post made within Time	Bold	Post is made after consensus, 60% loss
Non-Bold Leader	No Consensus Posted, -5 Points	<i>Ital. non-bold</i>	No Post Made, 100% loss



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Quiz 2

Range: 6-10; Average 8.9

W/ Text Historic 4-10; Average 8.5

30

of

51

Scored 10 out of 10 on Quiz 2



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De George Review

The first quiz question was about the De George model and 28% of you missed it, and 67% (14 of 21) of those who missed a question, missed this one.

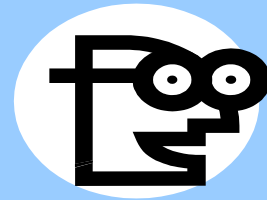
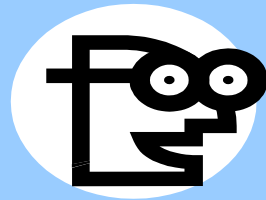
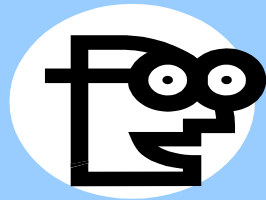
- **37 of 51 got it right**
- **12 of 14 of those who missed it, got the part addressing internal exhaustion wrong, and**
- **3 of the 14 missed got the part about the fundamental structure of De George wrong**

Whistle blowing decisions occur on three levels with two options at each level:

- **Level 1: No Moral Authority-Only ethically viable option is to remain quiet**
- **Level 2: Moral Authority but no Moral Duty-Ethically viable to either take action or remain quiet depending on the facts**
- **Level 3: Moral Duty to Blow the Whistle-Only ethically viable option is to blow the whistle**



E 401 Civil Engineering Seminar De George Review Questions:



It's QUESTION TIME !!



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**WHAT TYPE OF DAMAGES
DO ENGINEERING FAILURES CAUSE?**



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WHAT TYPE OF DAMAGES DO ENGINEERING FAILURES CAUSE?

Almost Always, the owner's expectations have not been satisfied.



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WHAT TYPE OF DAMAGES DO ENGINEERING FAILURES CAUSE?

Almost Always, the owner's expectations have not been satisfied.

Usually, there is property damage and financial loss



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WHAT TYPE OF DAMAGES DO ENGINEERING FAILURES CAUSE?

Almost Always, the owner's expectations have not been satisfied.

Usually, there is property damage and financial loss

Sometimes, there is personal injury



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WHAT TYPE OF DAMAGES DO ENGINEERING FAILURES CAUSE?

Almost Always, the owner's expectations have not been satisfied.

Usually, there is property damage and financial loss

Sometimes, there is personal injury

Occasionally there is loss of life



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WHY DO BUILDING FAILURES OCCUR?

Do some failures occur due to errors by design professionals?



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WHY DO BUILDING FAILURES OCCUR?

Do some failures occur due to errors by design professionals?

Do all failures occur due to errors by design professionals?



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WHY DO BUILDING FAILURES OCCUR?

Do some failures occur due to errors by design professionals?

Do all failures occur due to errors by design professionals?

What causes failures to occur when it is NOT an error by a design professional?



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WHY DO BUILDING FAILURES OCCUR?

Do some failures occur due to errors by design professionals?

Do all failures occur due to errors by design professionals?

What causes failures to occur when it is NOT an error by a design professional?

Construction Errors?



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WHY DO BUILDING FAILURES OCCUR?

Do some failures occur due to errors by design professionals?

Do all failures occur due to errors by design professionals?

What causes failures to occur when it is NOT an error by a design professional?

Construction Errors?

Post Construction Events such as poor/no maintenance?



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WHY DO BUILDING FAILURES OCCUR?

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Construction Errors?

Post Construction Events such as poor/no maintenance?

Post Construction Events such as unanticipated use of the facility?



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WHY DO BUILDING FAILURES OCCUR?

Do some failures occur due to errors by design professionals?

Do all failures occur due to errors by design professionals?

What causes failures to occur when it is NOT an error by a design professional?

Construction Errors?

Post Construction Events such as poor/no maintenance?

Post Construction Events such as unanticipated use of the facility?

Post Construction Events such as fires, earthquakes, sinkholes, hurricanes, tornadoes, tsunamis, impact by cars, trucks, ... , airplanes?



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Failures-Korean Shopping Center

1. Who is the owner of this facility?



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Failures-Korean Shopping Center

1. **Who is the owner of this facility? Sampoong Group, a Korean developer**
2. **Who designed the original 4 story structure?**



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Failures-Korean Shopping Center

1. **Who is the owner of this facility? Sampoong Group, a Korean developer**
2. **Who designed the original 4 story structure? Don't know because the designer is never identified in the video, or in any of the written accounts of this failure, but it could have been DB or the owner's in house design professionals**
3. **Who was the original builder and what happened to that builder?**



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Failures-Korean Shopping Center

1. **Who is the owner of this facility? Sampoong Group, a Korean developer**
2. **Who designed the original 4 story structure? Don't know because the designer is never identified in the video, or in any of the written accounts of this failure, but it could have been DB or the owner's in house design professionals**
3. **Who was the original builder and what happened to that builder? Woosung Construction. Installed the foundations, but when the owner wanted to change to shopping mall and add 5th floor, the owner fired Woosung because Woosung refused to build it that way.**
4. **Who was the new builder and who owned the new builder (company)?**



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Failures-Korean Shopping Center

- 1. Who is the owner of this facility? Sampoong Group, a Korean developer**
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- 4. Who was the new builder and who owned the new builder (company)? After firing Woosung Construction, Sampoong Group hired its wholly owned subsidiary construction company to build the facility in accordance with plans revised by Sampoong Group.**



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Failures-Korean Shopping Center

- 1. Who is the owner of this facility? Sampoong Group, a Korean developer**
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- 4. Who was the new builder and who owned the new builder (company)? After firing Woosung Construction, Sampoong Group hired its wholly owned subsidiary construction company to build the facility in accordance with plans revised by Sampoong Group.**
- 5. The Owner may have been the designer and the builder!!!!!!!!!! And the briber!!**



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Failures-Korean Shopping Mall

HAVE YOU LEARNED ABOUT PROJECT DELIVERY SYSTEMS?



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Failures-Korean Shopping Mall

HAVE YOU LEARNED ABOUT PROJECT DELIVERY SYSTEMS?

Design-Bid-Build (DBB)



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HAVE YOU LEARNED ABOUT PROJECT DELIVERY SYSTEMS?

Design-Bid-Build (DBB)

Design Phase: Owner Hires Prime Designer

Preliminary Design

Final Design

Regulatory Approvals

Construction Bidding: Owner submits Design for Competitive Bidding

Construction Phase: Owner hires contractor to build per plans & specs

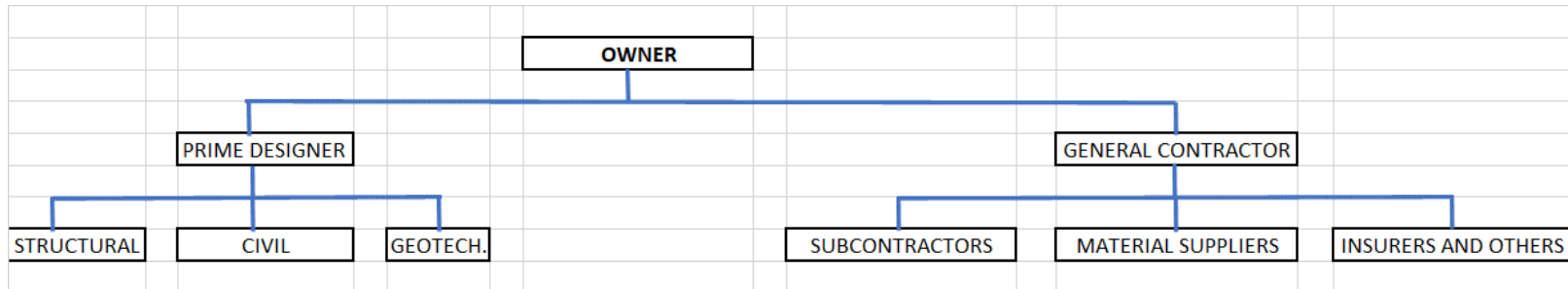


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Failures-Korean Shopping Center

1. The Design-Bid-Build Project Delivery Process.

1. The Owner Hires the Designer/Design Team?
2. The Owner Hires the Constructor/Builder?



What is the relationship between the Designer and Constructor?



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Failures-Korean Shopping Mall

HAVE YOU LEARNED ABOUT PROJECT DELIVERY SYSTEMS?

Design-Bid-Build (DBB)

Design Phase: Owner Hires Prime Designer

Preliminary Design

Final Design

Regulatory Approvals

Construction Bidding: Owner submits Design for Competitive Bidding

Construction Phase: Owner hires contractor to build per plans & specs

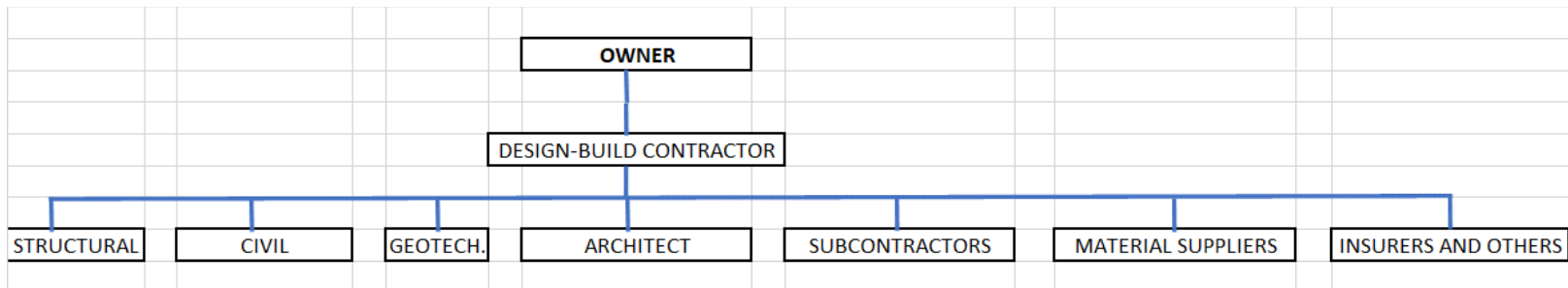
Design-Build (DB)



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1. The Design/Build Project Delivery Process.
 1. The Owner hires a Design/Build Contractor
 2. The DB Contractor does design work in packages, Foundations, Grading and Drainage, Structural Systems, Mechanical/Electrical Systems, Paving, etc.?
 3. The DB Contractor does the construction work as the various design packages are released.



As compared to the D-B-B model, what role do design professionals play in the D-B model?



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HAVE YOU LEARNED ABOUT PROJECT DELIVERY SYSTEMS?

Design-Bid-Build (DBB)

Design Phase: Owner Hires Prime Designer

Preliminary Design

Final Design

Regulatory Approvals

Construction Bidding: Owner submits Design for Competitive Bidding

Construction Phase: Owner hires contractor to build per plans & specs

Design-Build (DB)

Owner hires Design/Build Contractor

The design/Build contractor

Does design, Construction estimating, and construction in one singular motion.

Design Activity Performed Concurrently with Construction Process

Which Delivery System was probably used for Korean project?

Which Delivery System was used for the Hyatt project?

See: <https://www.levelset.com/blog/design-build/>



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CONSTRUCTION DELIVERY SYSTEMS

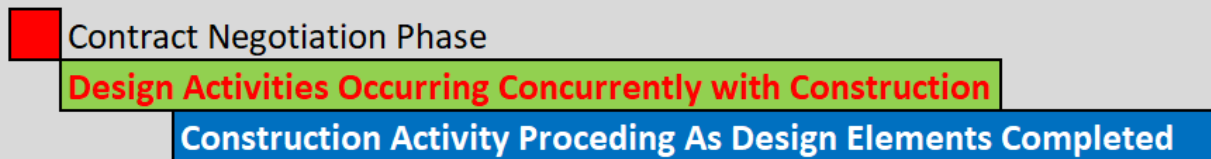
PROJECT DELIVERY SYSTEMS

Design-Bid-Build (DBB)



Separate Contracts Between Owner and Design Team and Between Owner and Construction Team

Design-Build (DB)



Single Contract Between Owner and Design-Build Contractor



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Failures-Korean Shopping Center

**Which Project
Delivery System
Makes Most Sense
for the Korean Case?**



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Failures-Korean Shopping Center

Discussion Question #1

In the video about the Korean shopping center collapse, we learned about a multi-story shopping center collapse that caused great loss of life and personal injury. Over the course of construction and operation, a litany of decisions ultimately produced this failure. The mistakes that led to this failure could have occurred during the design phase, the construction phase, or the post construction phase by either or each of the following parties: The owner, The Design Professionals, or The Construction Team. .

After watching the video about this failure, and reading the summary of this failure, please respond to the following:

a) Identify the two actions (or failures to act) that you believe contributed most to causing this collapse, and for each of your causes:

- 1. identify whether the action occurred during the design phase, the construction phase, or post-construction. For each action, you must choose only one phase (no fence-straddling).**
- 2. Identify whether the owner, the design team, or the construction contractor has primary responsibility for the action. For each action, you must choose only one party (no fence-straddling).**

b) In your opinion, which party (owner, designer, or contractor) holds the greatest and which party holds the least responsibility for the mistakes that led to this failure?

- | | |
|----------|-----------------|
| A | Januski |
| B | Hubbard |
| C | Konecny |
| D | Wallin |
| E | Spencer |
| F | Morrison |



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Failures-Korean Shopping Center

Discussion Question #1

1. Identify the two actions (or failures to act) during either design, construction, or post construction that you believe contributed most to cause this collapse.
 - **Changing from Office to Mall use- 60%**
 - Column size reduction-
 - Weak slab/column connections-
 - Owner ignoring designer advice-
 - Thinning support beams
 - **Adding lots of weight at top (5th floor, roof equipment, kitchen)- 37%**
 - Adding the 5th Floor-
 - Adding AC Units to roof-
 - Not redesigning for escalator, 5th floor, heavier loading -
 - **-Dragging AC units over roof slab when moved- 2%**
 - **-Not closing building when distress seen- 1%**
 - Not cause of failure
 - Clearly, expansion of number of injuries and deaths



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Failures-Korean Shopping Center

Discussion Question #1

2. When did each of these changes occur, and who decided to make the change?



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Failures-Korean Shopping Center

Discussion Question #1

2. When did each of these changes occur, and who decided to make the change?

- **Changing from office to mall?**



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Discussion Question #1

2. When did each of these changes occur, and who decided to make the change?

- **Changing from office to mall?**
- **Adding a 5th floor?**



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Failures-Korean Shopping Center

Discussion Question #1

2. When did each of these changes occur, and who decided to make the change?

- **Changing from office to mall?**
- **Adding a 5th floor?**
- **Moving the A/C Units on roof?**



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Failures-Korean Shopping Center

Discussion Question #1

2. When did each of these changes occur, and who decided to make the change?

- **Changing from office to mall?**
- **Adding a 5th floor?**
- **Moving the A/C Units on roof?**
- **Refusing to Evacuate building?**



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Failures-Korean Shopping Center

Discussion Question #1

- 3. In your opinion, which two parties (owner, designers, or constructors) hold the greatest, and least responsibility for the mistakes that led to this failure?**



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Failures-Korean Shopping Center

Discussion Question #1

- 3. In your opinion, which two parties (owner, designers, or constructors) hold the greatest, and least responsibility for the mistakes that led to this failure?**
 - Who decided to reopen the facility on the day of the collapse after an inspector said to evacuate?**



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Failures-Korean Shopping Center

Discussion Question #1

- 3. In your opinion, which two parties (owner, designers, or constructors) hold the greatest, and least responsibility for the mistakes that led to this failure?**
- Who decided to reopen the facility on the day of the collapse after an inspector said to evacuate?**
 - What happened to the owner and his son after this collapse?**



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Failures-Korean Shopping Center

Discussion Question #1

- 3. In your opinion, which two parties (owner, designers, or constructors) hold the greatest, and least responsibility for the mistakes that led to this failure?**
- Who decided to reopen the facility on the day of the collapse after an inspector said to evacuate?**
 - What happened to the owner and his son after this collapse?**
 - Who bribed the 12 building inspection officials?**



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Failures-Korean Shopping Center

Discussion Question #1

- 3. In your opinion, which two parties (owner, designers, or constructors) hold the greatest, and least responsibility for the mistakes that led to this failure?**
- Who decided to reopen the facility on the day of the collapse after an inspector said to evacuate?**
 - What happened to the owner and his son after this collapse?**
 - Who bribed the 12 building inspection officials?**
 - Why didn't the design professionals involved in this project also go to prison?**



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Failures-Hyatt

Discussion Question #2

The Missouri Court of Appeals affirmed the Board of Registration's finding that Dan Duncan and Jack Gillum were grossly negligent by citing that while custom may shift the practical responsibility for the box beam connection design to the fabricator, custom cannot shift the legal responsibility for that design. As a legal matter, the "buck stops" at the engineer of record.

- a) Explain what the Court of Appeals meant when it distinguished between "practical responsibility" and "legal responsibility" for design.**
- b) Identify the most important duty that the social contract between the public and the engineering profession imposes upon members of the engineering profession?**
- c) Explain how the Board's conclusions relative to Mr. Duncan and Mr. Gillum are consistent or inconsistent with this principal duty.**

A	Delaney
C	Lemons
E	Narasimha



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Discussion Question #2

- 1. Is the “punishment” imposed by the Profession against engineers like Mr. Gillum and Mr. Duncan the full punishment they receive for their GROSS NEGLIGENCE?**



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Discussion Question #2

- 1. Is the “punishment” imposed by the Profession against engineers like Mr. Gillum and Mr. Duncan the full punishment they receive for their GROSS NEGLIGENCE?**
- 2. How do victims gain compensation for their losses?**



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Discussion Question #2

- 1. Is the “punishment” imposed by the Profession against engineers like Mr. Gillum and Mr. Duncan the full punishment they receive for their GROSS NEGLIGENCE?**
- 2. How do victims gain compensation for their losses?**
- 3. Are engineers like Mr. Duncan and Mr. Gillum ever subject to criminal enforcement and prison time for their conduct?**



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Failures-Hyatt

Discussion Question #3

The technical explanation for the Hyatt collapse has been widely published, e.g. “Critical Design Change Responsible for Collapse at Hyatt.” As you know from the readings, the critical design change occurred with the the 4th floor walkway box beam support, changing from a single rod to a double rod connection based on a shop drawing submitted by the project's steel fabricator. Given the social contract that establishes engineering as a profession, the public can place trust in a reasonably prudent structural engineer to analyze the proposed double rod connection and either approve its use if adequate or require a different connection detail if inadequate.

1. Explain why the structural engineers of record did not recognize the inadequacy of the double rod connection thereby allowing the use of the double rod connection. In your answer, please address at a minimum each of the following questions:

- **Was the analysis so complex that the engineers made an analytical error?**
- **Did the engineers fail to verify that the connection was fabricated and installed as designed?**
- **Did the engineers fail to perform the analysis?**
- **Are there other explanations for the engineers’ failure to recognize the inadequacy of the double rod connection?**

2 What is the difference between “Gross Negligence” and “Negligence?”

3. Why did the Board of Registration find Gross Negligence rather than Negligence with respect to the structural engineers of record for this project?

B	Arnieri
D	Fonseca
F	Holbrook



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Discussion Question #3

1. Did the engineers, Gillum and Duncan, lose their engineering licenses as punishment for a finding of legal liability or ethical violations?



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Discussion Question #3

1. Did the engineers, Gillum and Duncan, lose their engineering licenses as punishment for a finding of legal liability or ethical violations? **Ethical Liability-Not doing what they SHOULD have done per Ethical Standards for the Profession BASED ON GROSS NEGLIGENCE.**
2. **How were they held accountable for their legal civil liability, if at all?**



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Discussion Question #3

1. Did the engineers, Gillum and Duncan, lose their engineering licenses as punishment for a finding of legal liability or ethical violations? Ethical Liability-Not doing what they SHOULD have done per Ethical Standards for the Profession **BASED ON GROSS NEGLIGENCE.**
2. How were they held accountable for their legal civil liability, if at all? **Civil Lawsuits Settled out of court using a pool of insurance money after the Board's finding of GROSS NEGLIGENCE.**
3. **How were they held accountable for their legal criminal liability, if at all?**



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Discussion Question #3

1. Did the engineers, Gillum and Duncan, lose their engineering licenses as punishment for a finding of legal liability or ethical violations? Ethical Liability-Not doing what they SHOULD have done per Ethical Standards for the Profession **BASED ON GROSS NEGLIGENCE.**
2. How were they held accountable for their legal civil liability, if at all? Civil Lawsuits Settled out of court using a pool of insurance money after the Board's finding of **GROSS NEGLIGENCE.**
3. How were they held accountable for their legal criminal liability, if at all? **There was no criminal prosecution for wrongful death**



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Hyatt Regency, Kansas City

- **Negligence Law Overview:(To Put Case in Context)**
 - **Four Elements, all must be proven for negligence**
 - **Duty Owed (to injured party)**
 - **Duty Breached (by the defendant party)**
 - **Real Damages**
 - **Causal Link Between Breach and Damages**
 - **Negligence occurs with “Absence of Reasonable Care”**
 - **What would a reasonably prudent person have done?**
 - **Is a Reasonable Person Standard for conduct**



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Hyatt Regency, Kansas City

- **Negligence vs Gross Negligence:**

- **All Elements of Negligence plus conduct so egregious that a Jury finds**

- **Reckless disregard for the well being of others, or**

- **Extreme Carelessness, or**

- **A Failure To Use Even Slight Care**

- **Professionals seldom lose licenses due to negligence**

- **Engineers in Hyatt Case Lost License based on findings of Gross Negligence**



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Hyatt Regency, Kansas City

- **Slides provided by the Kansas City Star**
- **An informant appeared to a KC Star reporter at the scene on the night of the collapse with information about the cause of the collapse**
- **This informant told the reporter that an approved shop drawing would explain the cause of the collapse**



CE 401 Civil Engineering Seminar

Hyatt Regency, Kansas City

•Slide Presentation:

- Kansas City Star who won a Pulitzer prize for their coverage of this failure.
- One reason they won the Pulitzer Prize is information the paper received from a whistleblower the night of the failure.



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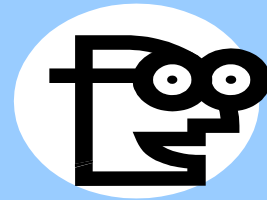
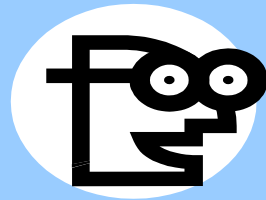
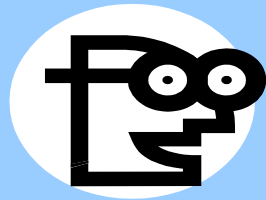
Hyatt Regency, Kansas City

As you watch the slides, think about this informant:

- **What did this person know?**
- **When did this person first know this?**
- **How would anyone acquire this knowledge?**
- **Who would be in position to acquire this knowledge?**
- **What training/expertise is necessary to understand the significance of the shop drawing?**
- **What level of moral obligation to blow the whistle before the failure would De George assign to this person?**
- **Is this informant a hero or a villain?**
- **Why does this person remain anonymous?**



E 401 Civil Engineering Seminar Hyatt Regency Questions:



It's QUESTION TIME !!