

# El Profesor Ken

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Celebrating the Retirement and  
Legacy of Ken C. Hover, Part 2 of 4

Bruno Fong-Martinez, PhD

ACI Spring 2024 Convention | New Orleans, LA  
March 25, 2024



DESIGN OF CONCRETE STRUCTURES CEE 4730

CONCRETE MATERIALS & CONSTRUCT CEE 6750

SPEC TOPICS IN STRUCT ENGR CEE 6075

COURSE TOPIC(S) : ADVANCED CONCRETE MATERIALS

ADVANCED STRUCTURAL CONCRETE CEE 7740

SPEC TOPIC IN CIVIL & ENV ENGR CEE 3090

COURSE TOPIC(S) : PROJECT LEADERSHIP

Concrete words: Prof. Ken Hover



Professor Hover is one of the best teachers.













Handwritten notes and diagrams on various pages, including a table of concrete ingredients and several graphs showing concrete properties.

Component	Specific Gravity	Total Weight in Batch (lb)
Coarse Aggregate (crushed stone)	2.62	1144
Fine Aggregate (sand)	2.64	98
Portland cement	3.15	41
Water	1.00	2

**Total Weight Batched** = 1285 lb  
**Total volume of ingredients not including air** = 480.5 cu ft  
**Estimated air volume in total batch of concrete** = 10.5 cu ft  
**Estimated air volume as a percentage of total volume of air plus all other ingredients** = 2.2%





CEE 4730/6730

Quiz #1, Tuesday, September 03, 2013

Name Bruno Fong Martinez

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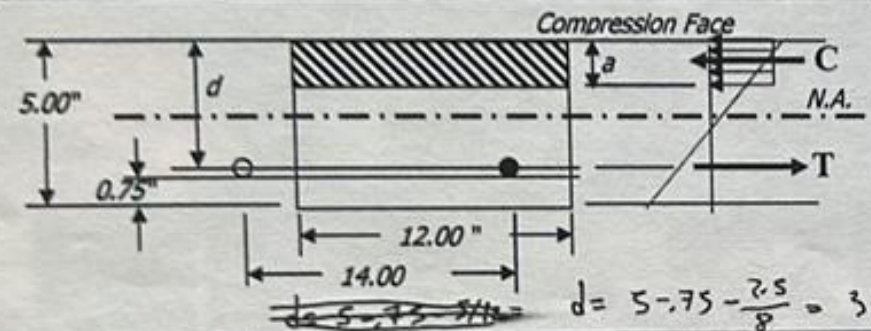


Clarity factor	Correctness 5	Quiz Score
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CEE 4730/6730  
Quiz #15, October 8, 2013

Name Bruno Fong Martinez

**Ultimate Moment Capacity of a 12" wide slab strip**



$f_c = 4,000 \text{ psi} = 4.00 \text{ ksi} = 4.00 \times 10^3 \text{ psi}$   
 Reinforcing = #5 bar @ 14.00"  
 Area of each bar = 0.310 in<sup>2</sup>  
 $f_y = 60.0 \text{ ksi}$   
 Carry dimensions to 2 decimal places.

~~$d = 5.00 - 0.75 = 4.25$~~   
 $d = 5.00 - \frac{2.5}{8} = 3.94$

1. $A_s = 0.27 \text{ in}^2$ ✓		2. $d = 4.04$ <del>3.94</del> X in		<b>ASSUME REINFORCING STEEL HAS YIELDED PRIOR TO CRUSHING OF THE CONCRETE</b>	
3. Ultimate tensile force $= T = A_s f_y$  16.2 Kips ✓		4. Ultimate compression force $= C = T$  16.2 Kips ✓		5. $C = (0.85 f_c)(b)(a)$ $a = C / [(0.85 f_c)(b)]$ $a = 0.40$ ✓	
6. $a/2 = 0.20$ ✓		7. Internal moment arm = $(d - a/2) = 3.94 - .2 = 3.74$ <del>3.84</del> X in			
8. Internal moment = $M_n = T(d - a/2)$ $M_n = (3.74)(16.2) = 60.6$ <del>62.21</del> X 65.12 in-kips		9. Internal moment = $M_n = T(d - a/2)$ $M_n = \frac{60.6}{12} = 5.05$ <del>5.18</del> X <del>5.43</del> Ft-kips		10. Usable moment = $\phi M_n = (0.9)5.05 = 4.55$ <del>4.67</del> X <del>4.89</del> Ft-kips	

CEE 7740

Quiz #8, February 10, 2015

Name Bruno Eny Martinez

10

**A story problem:**

Kenny Hoover owns 50 pairs of socks, which means that he could wear a clean pair every day for 50 days without washing socks<sup>1</sup>.

However, when that day finally came, he washed all 50 pair<sup>2</sup>. He put them all in the washing machine at one time. When the buzzer buzzed, he took them all out of the washing machine, but since they were all heavy-duty wool socks, even after the spin-cycle they were still quite wet and each wet sock weighed 1.00 lb.

Responding to a distant and partial memory from childhood, Kenny recalled that for extra freshness and environmental friendliness, he should dry his wet socks them by "hanging them out to dry." So he took all 100 socks, put them in a plastic bag, and hung the bag from the branch of a tree in the back yard. He tied the bag to the tree with a single rope, as shown in Figure 1 below.

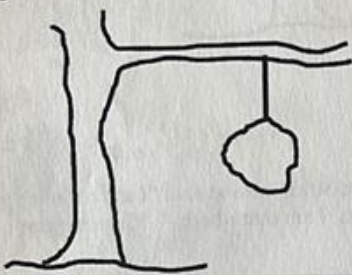


Figure 1

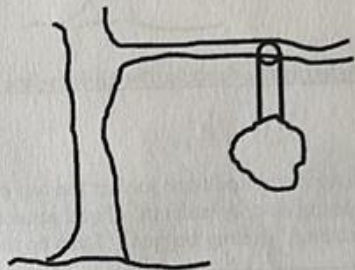
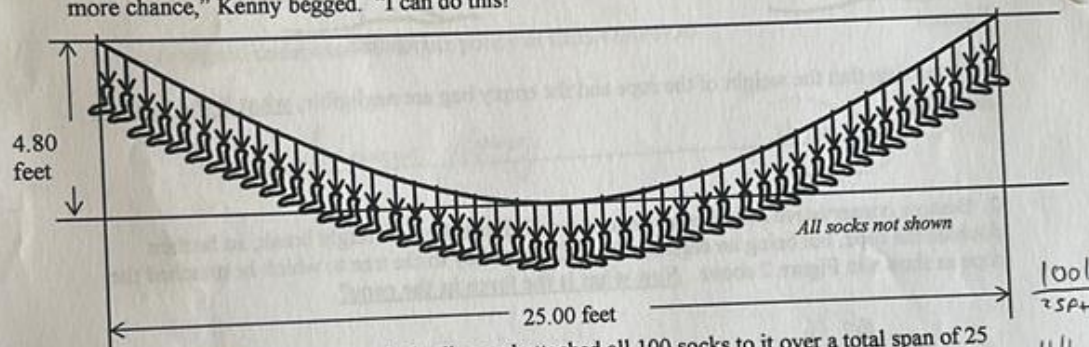


Figure 2

4. Kenny's wife took one look at the bag of socks on the clothesline and said "I am not even going to unpack my suitcase. If you cannot even dry socks, I am outta-here!" "Give me one more chance," Kenny begged. "I can do this!"



So Kenny rigged-up a proper clothesline and attached all 100 socks to it over a total span of 25 feet. Each sock was carefully hung at exactly a 3.00-inch spacing so as to generate (as nearly as possible) a uniformly distributed downwards force on the clothesline. There were therefore exactly 4 socks per foot<sup>3</sup>. Kenny was very pleased that the deflected shape of the uniformly loaded clothesline was a perfect parabola with a total horizontal projection of 25.00 feet and a total vertical rise of 4.80 feet. **Now what is the force in the clothes-line rope?**

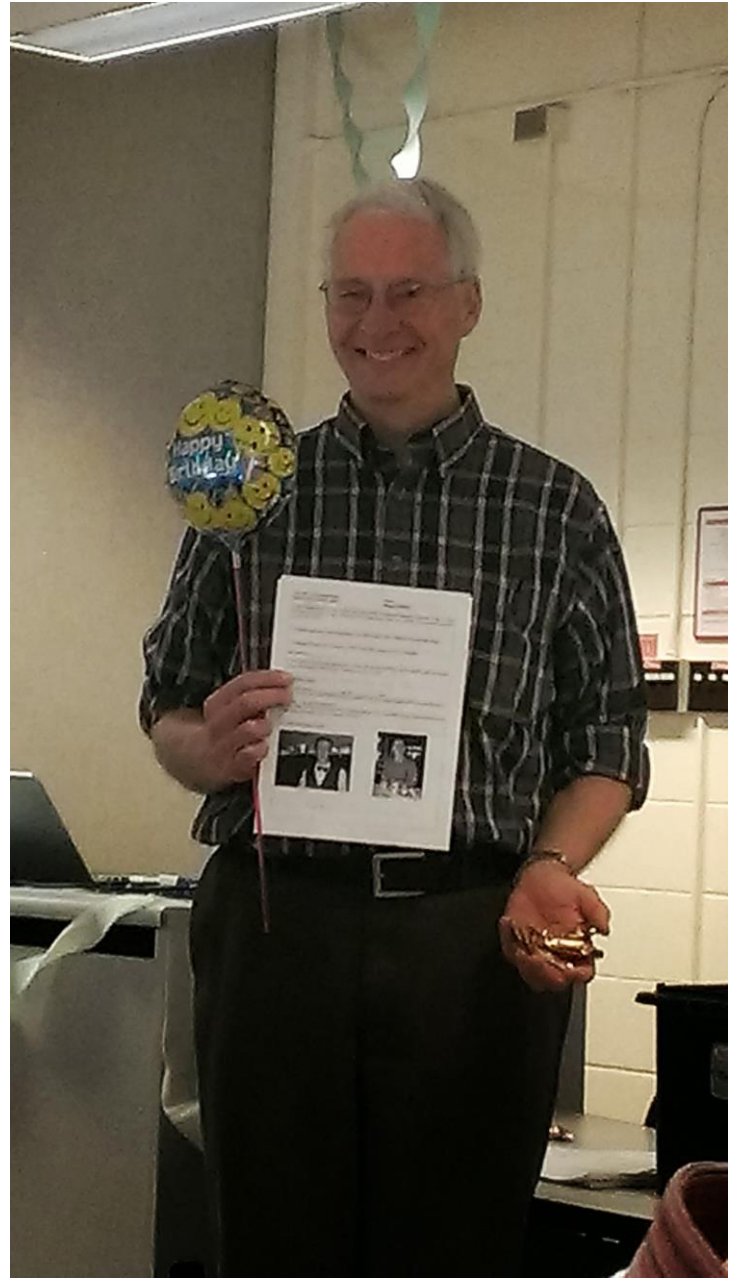
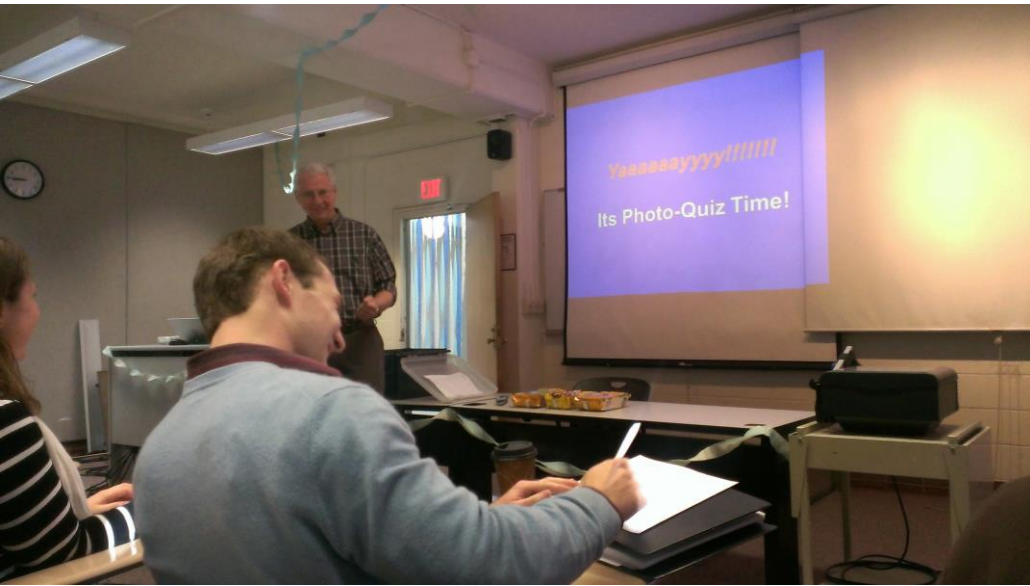
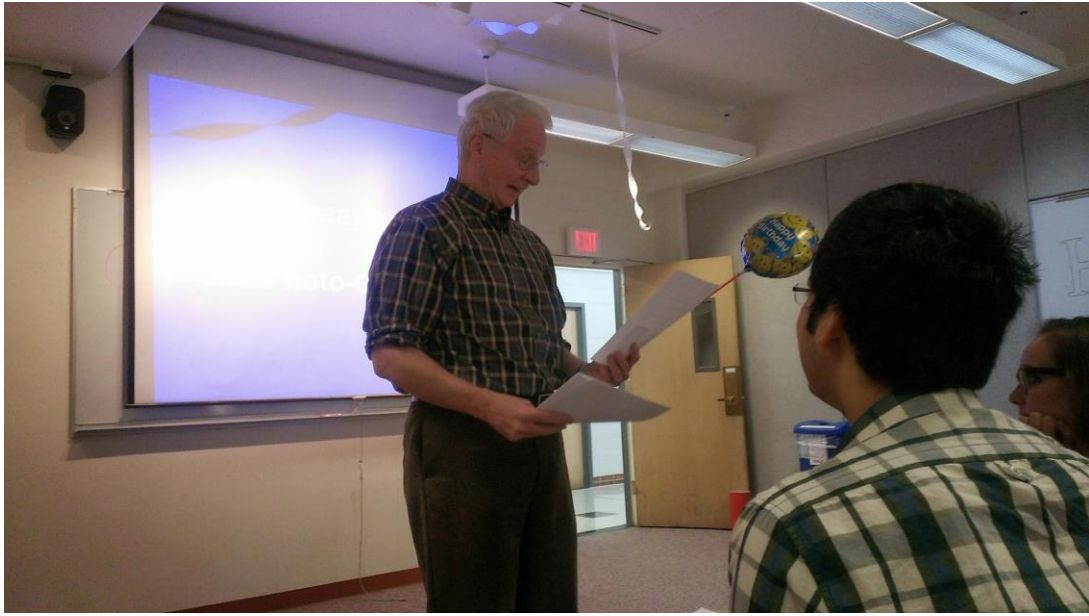
$$W' = 8Th/L^2$$

$$h = 4.80'$$
$$L = 25'$$
$$w' = 4 lb/ft$$

$$T = \frac{w' L^2}{8h} = \frac{(4)(25)^2}{(8)(4.8)} = 65.1$$

<sup>3</sup> Don't get confused; except in cold weather, we usually only wear one sock per foot. Note also that this is the third and final, "foot" note.





ACI Spring 2024 Convention  
 New Orleans, LA  
 Honoring the Legacy of Ken C. Hover  
 Part 2 of 4  
 Quiz #1, Monday, March 25, 2024

Name \_\_\_\_\_

Clarity Factor	Correctness	Quiz Score

# Hoverisms Bingo

Fahggeddabowdit!	If I'm lying, I'm dying!	Why do things the easy way when the hard way works almost as well?	Ithaca is Gorges because of poor quality local geology.	I SAY, WHAT TIME IS IT?! CONCRETE TIME!
As the cool kids say...	Go down to the commons and ask Madame Zelda for guidance	But wait, there's more! And at no extra charge!	Kipperoonis!	Now we're cookin' with gas!
Simultaneously and at the same time!	We're all better people because of it.	Speak to me son, speak to me!	DON'T THINK!	The Nutritious axis
Right here at Corn-Hill University in It-haca New York	GET OUT!	That's him Jim!	And if you come from a civilized country, we also have metric here	-3 for sig figs and a .5 clarity factor
I'M DOWN!! ARE YOU DOWN?! CUZ' I'M DOWN!	The anointed ones	Noooo, teacher	There'll be peace in the valley and dancing in the streets!	Are you with me son? I say, son are you with me?



## SHARE *the* LOVE

Simply scan and upload.  
 Ken Hover NOLA  
*Mon Mar 25 2024*





Hey Bruno, question for you.

Dr. Mr. Fong Martinez. Let me know if you have some free time to review

Could you stop by if you have some free time?

Hi Bruno, I hope all is well. Happy 4th of July! We had a concrete related incident today that we want to get your expert opinion about it please. Will you be in tomorrow morning? I will email you the question in a bit.

Hey what are your thoughts on this concrete

Can you stop by wen you get a chance?

Hi Bruno. I work for [REDACTED] and was talking to [REDACTED] about a concrete problem

They referred me to you saying you might be able to help. Could you let me know if you have a minute to chat sometime today

perfect, thanks Bruno! Always learn something new when we chat



1





Design Team Name \_\_\_\_\_

**CEE 4730/6730 Design project checklist-Phase II LRFD Reinforced Conci**

**Due: Section 3: Noon, Monday, 10/7; Full Design Friday, 10/11/2013.**

Item	Description	Points Possible
<b>1</b>	<b>Professional cover letter, contents and invoice</b>	
1.1	Print-out and include a copy of this checklist. To the right of each line clearly insert initials of the <b>one</b> person responsible for making sure that the item is correct and is included in the submittal. Fill-in cost-this-period and cost-to-date.	Overall project Multiplier of 0 or 1
1.2	A professional cover letter that clearly <i>and concisely</i> describes the purpose of the submittal and changes made to the original design. ( <i>We are replacing the simple-span precast/prestressed concrete plank &amp; topping floor system with a continuous reinforced concrete slab designed by LRFD principles. This may require a modification of spans (spacing of bearing walls).</i> )	5
1.3	Logo, letterhead, professional address and signatures	2
1.4	Invoice to date—show this period charges and cumulative charges to date— <i>Note: Your overall charges = direct salary PLUS an overhead that is roughly 1.6 to 1.9 times the direct salary. TOTAL cost therefore = direct salary times 2.6 to 2.9. Also make sure the invoice is understandable. As the client I will refuse to pay an invoice that I cannot understand and does not appear to be based on careful recording of hours actually worked. You have received zero payments to date.</i>	Overall project Multiplier of 0 or 1 (Assigned by Hover)
1.5	Date and uniquely identifying page number on every single page in submittal.	5
1.6	Name of the person doing the calculations on each page.	5
1.7	Academic requirement: describe the individual contributions of each team member for this project phase. This is independent of the invoice.	5
1.8	At the end of the letter include a detailed list of attached pages.	2
1.9	Overall professional impression—Does this look “real?” Would the engineering firm be proud of this formal submittal to the owner? Sloppy letter suggests sloppy engineering (even though there may be no genuine correlation)	10
<b>1.10</b>	<b>Subtotal</b>	<b>34</b>

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7. Internal moment arm = $(d-a/2) = 3.74 \text{ in}$ ✓	8. Internal moment = $M_u = T(d-a/2) = 60.6 \text{ Ft-kips}$ ✗	9. Internal moment = $M_u = T(d-a/2) = 50.5 \text{ Ft-kips}$ ✗	10. Usable moment = $\phi M_u = 46.67 \text{ Ft-kips}$ ✗



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## KEN HOVER'S EXPRESSION OF EVERYDAY EXCELLENCE

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While writing his master's thesis on the design of falsework for the construction of concrete bridges, Hover worked as a project engineer, building bridges over the Ohio River. He spent three years as an officer in the Army Corps of Engineers, then joined a structural design firm. During this time, he was involved in the design and/or restoration of more than twenty seriously deteriorated structures, and became interested in the analysis and rehabilitation of deteriorated concrete. This led him to Cornell, where he completed his doctorate and joined the faculty in 1984.

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in the classroom, the lab, or in office hours when a student suddenly "gets it." The instant of comprehension is an exciting event and I love to be part of it!

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*What one piece of advice that you received over the years made a difference for you?*

Let me give you four answers: first, I was advised that when selecting graduate schools, one should focus on who you were going to work with rather than where you are going to study. That led me to Cornell because of the critical mass of collaborative faculty specializing in the design and construction of concrete structures at that time.

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- Ken Hover, Cornell Professor 2023

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- Bruno, Ken’s Student 2013-Present

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