Recitation 004

09/13/2024

GSI Info

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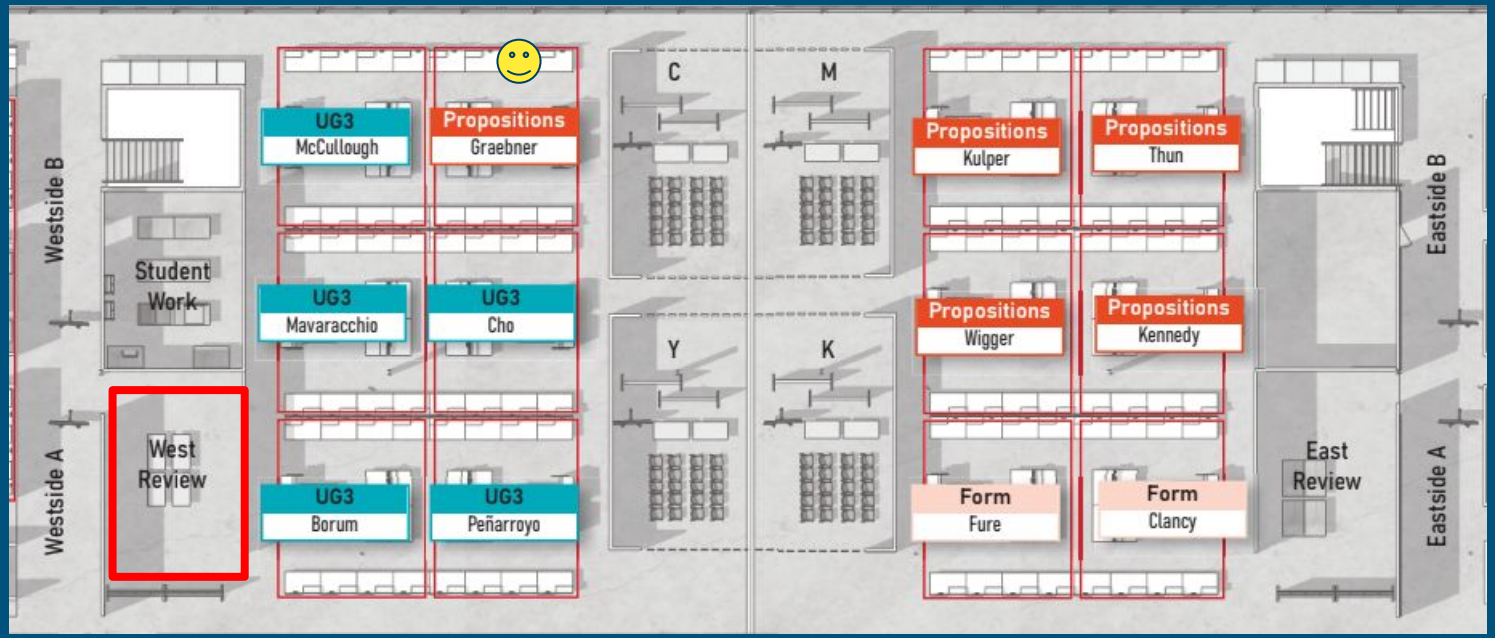


Questions

Due Dates / Important Announcements

- Topic Quizzes & Homework are due on Sundays at 11:59 pm
  - Unless otherwise noted by PVB

- You get ability to make-up a lab for full credit
  - Then points will be deducted

- Reminder: Topic Quizzes are individual quizzes that are open-note, open lecture

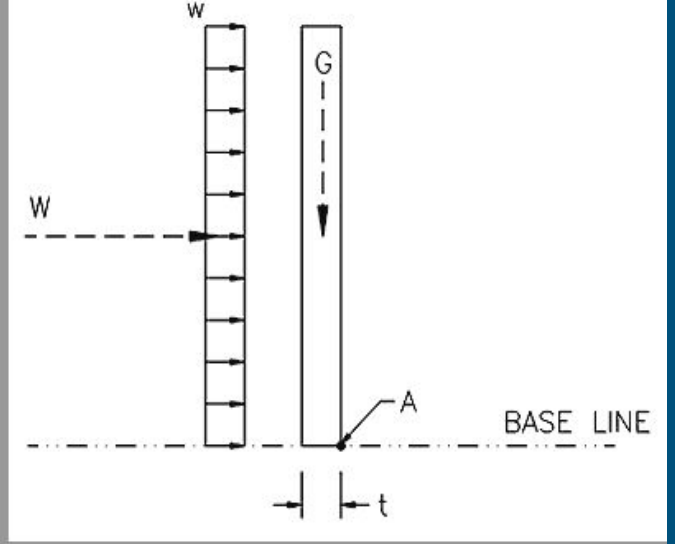
HW #3

3. Moment of a Force

Find the total wind force (W) in LBS normal to the wall that would cause an overturning moment equal to the resisting moment from gravity (G).

DATASET: 1 -2- -3-

Wall thickness	8 IN
Density of wall	110 PCF
Height of wall	6 FT



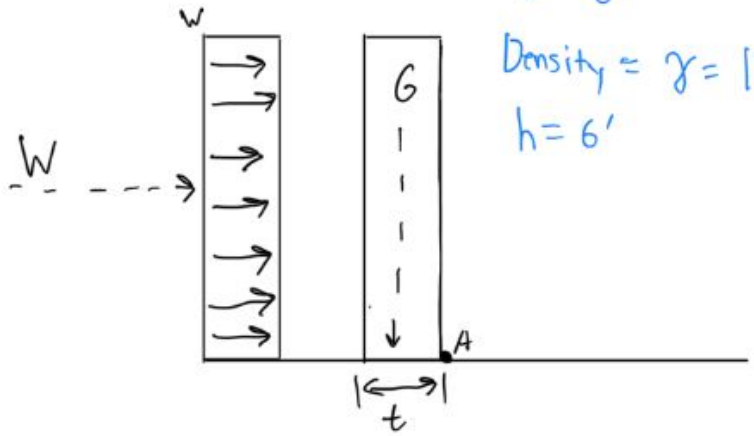
#	Question	Your Response
1	Total weight of 1 linear foot length of wall (G)	440 PLF
2	Moment arm length for resisting gravity moment	4 INCH
3	Resisting moment of 1 linear foot length of wall about point A (absolute value)	146.667 FT-LBS
4	Moment arm length for overturning wind moment	3 FT
5	Overturning wind force W acting on a 1 linear foot length of wall area	48.889 LBS
6	Wind pressure on wall	8.14817 PSF

Due 9/15/24

$t = 8''$

Density $= \gamma = 110 PCF$

$h = 6'$



1.) Total weight of 1 linear foot length of wall (G)

$= \gamma \times t \times h$

$= 110 PCF \times \frac{8''}{12''} \times 6' = 440 PLF$

↑ Convert inches to feet

2.) Moment Arm Length for resisting gravity moment

$$\frac{t}{2} = \frac{8''}{2} = 4''$$

3.) Resisting moment of 1 linear foot length of wall about Point A

$M_A = W \times E$

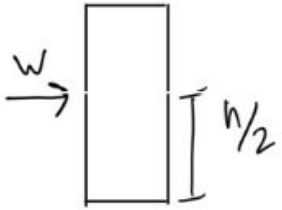
E: moment Arm from #2

W: Total weight from #1

$= 440PLF \times \frac{4''}{12''} = 146.6667$ ft/lbs

$\frac{4''}{12''}$: convert inches to feet

4.) Moment arm length for overturning wind moment



$\frac{h}{2} = \frac{6'}{2} = 3'$

5.) Overturning wind force W acting on a linear foot length of wall area

$$M_R = W \times \frac{h}{2} \rightarrow W = \frac{2 M_R}{h}$$

Resisting moment from #3

$$W = \frac{2(146.667 \text{ ft/lbs})}{6'} = 48.889 \text{ lbs}$$

6.) Wind Pressure on wall

wind force W from #5

$$\text{Pressure} = \frac{W}{h} = \frac{48.889 \text{ lbs}}{6'} = 8.1482 \text{ PSF}$$

LAB