

2-19-08

Class 3

Read Ch 1 + 2 (steel)

Ch 1 (concrete)

HW # 1 Due 2/26

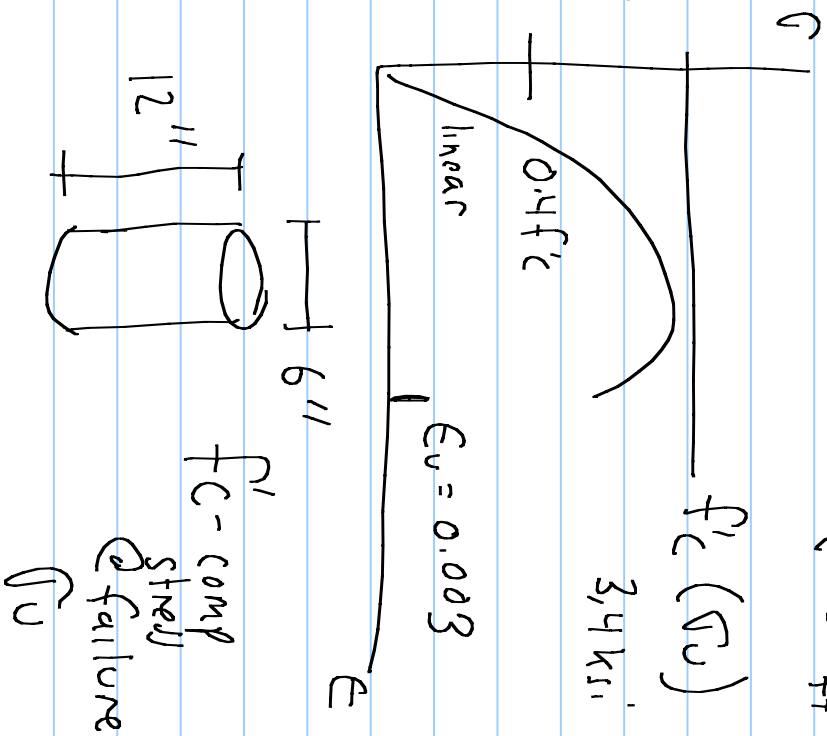
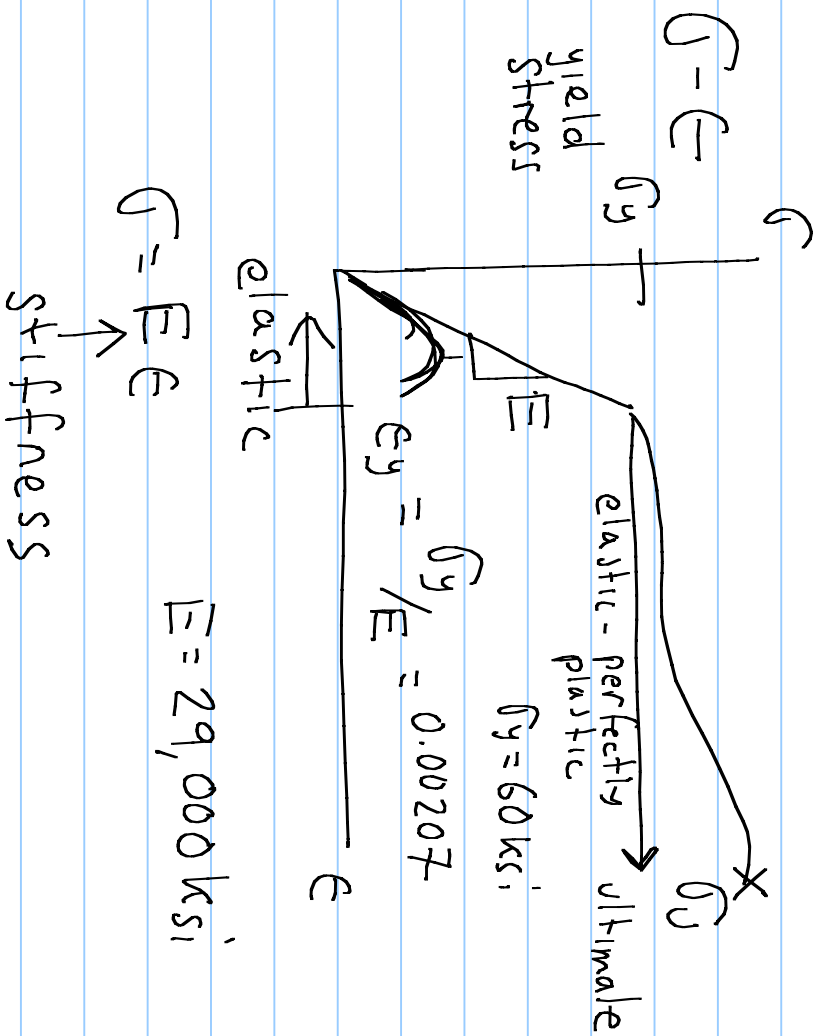
No class Thursday

Class Monday 2/25

Material Properties CIEG 213 Lab

Steel (490 lb/ft³)

Concrete (145 lb/ft³)
reinforced concrete (150 lb/ft³)

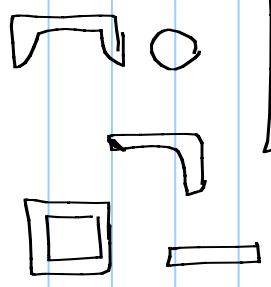
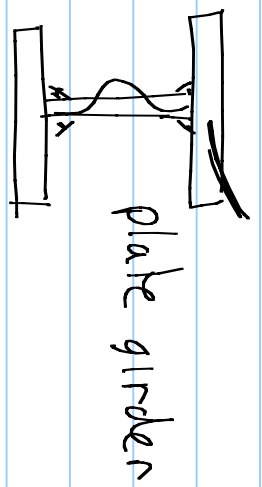
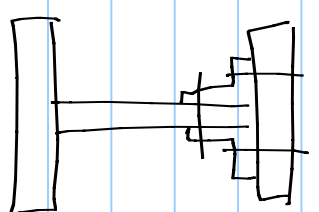
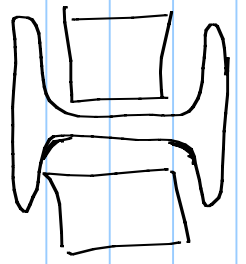


concrete + admixture
 cement + aggregate + water

$$f_y = f(\text{temp})$$

Type II ✓
 I, III, IV w/c ↑ f'_c ↓
 0.4 w/c ↓ f'_c ↑ ↑ workability

I-beam



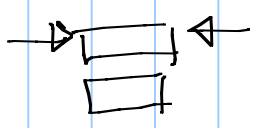
$f'_c - 28 \text{ days}$



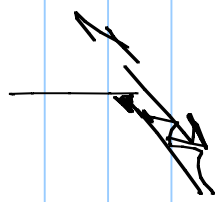
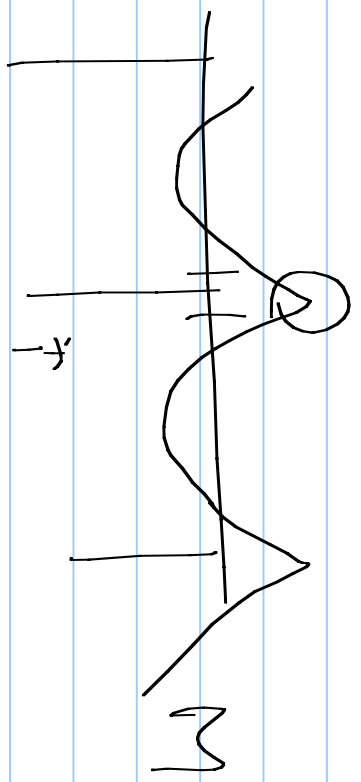
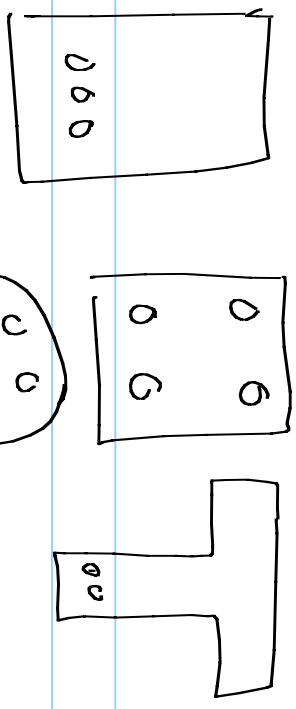
$$f'_c = f(\text{time})$$

creeps

shrinkage



fatigue — steel buckling (local, global)

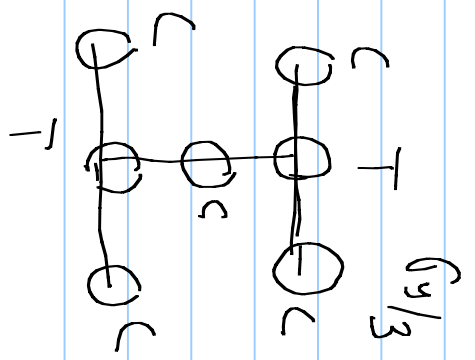
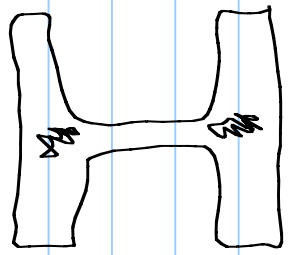


$$E = 57,800 \sqrt{f_c}$$

psi

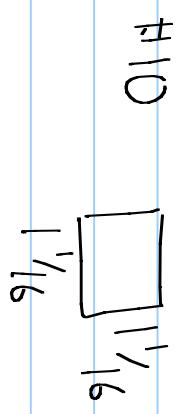
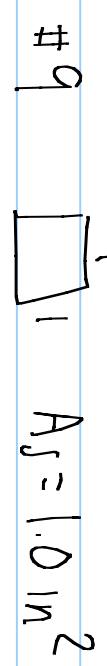
$$f_c [psi]$$

residual stresses



empirical
experimentally
derived

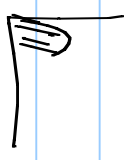
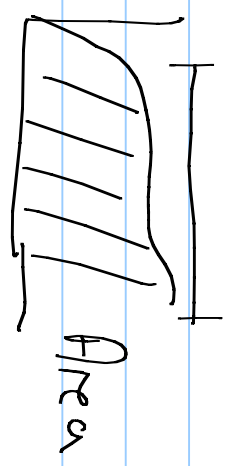
slabs
 #3 - 3/8" I
 #8 - 1" *
 beams, columns
 #9
 #10
 #3 - 18
 deformed
 #3 - #10



Ductility

Steel very ductile

Concrete - brittle



Durability (Environment)

Steel — paint, weathering steel

Concrete — rebar ~~and~~ rusting