

**ARCH 207, 507, 2006 HW #5**

**Steel Frame (Problem 5a)**

Live Load: Roof 30 lbs/ft<sup>2</sup>  
 Floor: 100  
 Dead Load: Roof 100 lbs/ft<sup>2</sup>  
 Floor 150  
 Steel  $F_b$  50,000 lbs/in<sup>2</sup>  
 Factor of Safety .66

**Roof**

1. Uniform load (w), roof joist \_\_\_\_\_
2. End reaction, roof joist \_\_\_\_\_
3. End reaction, roof girder (int) \_\_\_\_\_
4.  $M_{max}$ , roof joist \_\_\_\_\_
5.  $M_{max}$ , roof girder (int) \_\_\_\_\_
6. Section Modulus, roof joist \_\_\_\_\_
7. Section Modulus, roof girder (int) \_\_\_\_\_
8. Size roof joist \_\_\_\_\_
9. Size roof girder (int) \_\_\_\_\_

**Floor**

1. Uniform load (w), floor joist \_\_\_\_\_
2. End reaction, floor joist \_\_\_\_\_
3. End reaction, floor girder (int) \_\_\_\_\_
4.  $M_{max}$ , Floor joist \_\_\_\_\_
5.  $M_{max}$ , Floor girder (int) \_\_\_\_\_
6. Section Modulus, floor joist \_\_\_\_\_
7. Section Modulus, floor girder (int) \_\_\_\_\_
8. Size floor joist \_\_\_\_\_
9. Size floor girder (int) \_\_\_\_\_
10. Max.axial load in Column (B3) \_\_\_\_\_
11. Preliminary Column Size (B3) \_\_\_\_\_
12. Slenderness Ratio (KL/r) \_\_\_\_\_  
 L and r in inches!
13. Max. allowable ( $f_c$ ) based on Slenderness Ratio(Table), x 1.4) \_\_\_\_\_
14. Final Column Size (B3) \_\_\_\_\_

**Steel Frame (Problem 5b)**

Live Load: Roof 100 lbs/ft<sup>2</sup>  
 Dead Load: Roof 100 lbs/ft<sup>2</sup>  
 Steel  $F_b$  50,000 lbs/in<sup>2</sup>  
 Factor of Safety .66

**Roof**

1. Uniform load (w), roof joist \_\_\_\_\_
2. End reaction, roof joist \_\_\_\_\_
3. End reaction, roof girder \_\_\_\_\_
4.  $M_{max}$ , roof joist \_\_\_\_\_
5.  $M_{max}$ , Roof Girder \_\_\_\_\_
6. Section Modulus, Roof Joist \_\_\_\_\_
7. Section Modulus, Roof Girder \_\_\_\_\_
8. Size Roof Joist \_\_\_\_\_
9. Size Roof Girder \_\_\_\_\_
10. Max.axial load in Column \_\_\_\_\_
11. Preliminary Column Size \_\_\_\_\_
12. Slenderness Ratio (KL/r) \_\_\_\_\_  
 L and r in inches!
13. Max. allowable ( $f_c$ ) based On Slenderness R(See Table) \_\_\_\_\_
14. Final Column Size \_\_\_\_\_

