ENDS 231. Extra Credit on Load Tracing

Date: 10/10/07, *due10/18/07*   *Maximum 15 Quiz Points*

Problem:

Loads:

Roof:	DL = 10 psf
	LL = 25 psf
	(snow horizontally projected)
Ceiling:	DL = 5 psf
	LL = 10 psf
Bearing walls:	DL = 10 psf (2nd and 3rd floors)
Floors:	DL = 20 psf (2nd and 3rd floors)
	LL = 40 psf (2nd and 3rd floors)
1st floor column:	3" standard pipe, 10.8 lb/ft
Garage Slab:	on grade, isolated from footings
Concrete:	150 lb/ft^3
Soil-bearing Pressure	2200 psf
Footings	8" thickness on pads, 8" x 24" stem on wall footing

(a)
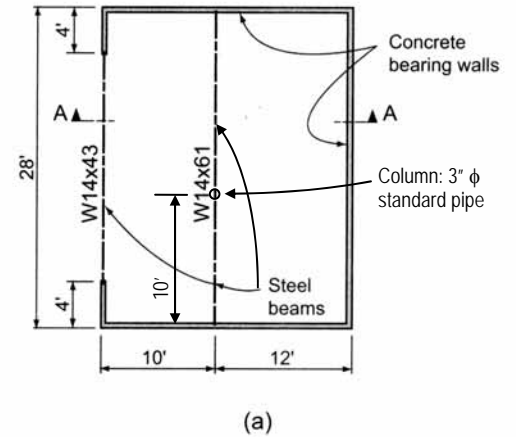
1. Determine the equivalent (horizontally projected) load on the rafters spaced at 2'0" on centers.
2. Determine the load per foot on the bearing walls.
3. Determine the loading and beam reactions for each of the steel wide flange beams.
4. Determine the column load.
5. Determine the minimum width of the continuous foundation.
6. Determine the size of the column spread footing.

(b)

(c)
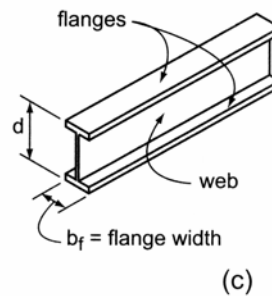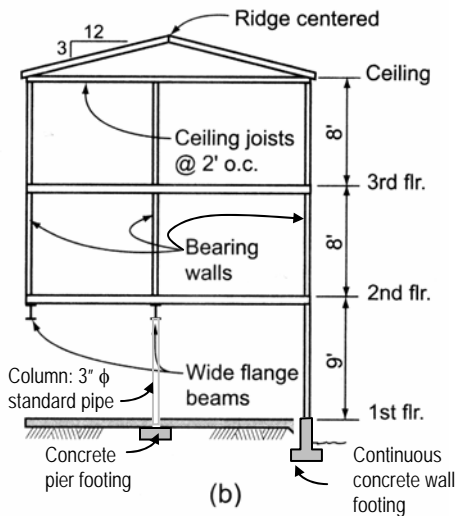
W 14 x 61
 — weight per foot (or meter) in pounds (or kg)
 — approx. beam depth (in inches or mm)
 — 'W' or type of cross section

(a) First floor plan. (b) Section A-A. (c) Steel wide-flange section.