#2.1

	psf
Hardwood	4
Plywood	3
Framing	2.6
Ceiling supports	0.5
Gypsum wallboard	5
Total	15.1

#2.2

1. Concrete slab/unit area		
1 ft x 1ft x 1/12 ft x 150 pcf	12.5	
2. Framing DL adjustment		
Load@ 4 in. OC, i.e 3 sect/ft	2.6	
Load/section	2.6/3	
At 3 in. OC, # sections/ft	4	
Load of 4 sec/ft @ 3 in OC	4*2.6/3 =	3.47

3. Floor DL		
Concrete slab	12.5	
Plywood	3	
Framing	3.47	
Ceiling supports	0.5	
Gypsum wallboard	5	
Total	24.47	

#2.3

1. L_0, psf	40
2. Tribuary area = 20 x 17.5	350
3. For interior beam, K_{LL}	2
4. $K_{LL}A_T$ = 2*350	700
5. $K = 0.25 + \frac{15}{\sqrt{700}}$	0.82
LL = k L_0 = 0.82*40	32.68

2.4

1. Basic LL for office	50		
2. A_T = 40*40	1600		
3. For interior column K_{LL}	4		
4. $K_{LL}A_T$	6400		
5. $K = 0.25 + \frac{15}{\sqrt{6400}}$	0.44	Use min	0.5
LL = 50*0.5	250		

2.5

1. For gymnasium L_o, psf	100.00		
2. A_T = 50 x 20	1000.00		
3. K_{LL}	4.00		
4. $K_{LL}A_T$	4000.00		
5. $K = 0.25 + \frac{15}{\sqrt{4000}}$	0.49	Use min	0.50
LL = 100*0.5	50.00		

2.6

1. K_{LL}	1.00		
2. A_T = 50x20	1000.00		
4. $K_{LL}A_T$	1000.00		
5. $K = 0.25 + \frac{15}{\sqrt{1000}}$	0.72		
LL = 100*0.72	72.00		

2.7

1. Office from 2 floors L_o, psf	100.00		
2. A_T = 40x40	1600.00		
3. K_{LL}	4.00		
4. $K_{LL}A_T$	6400.00		
5. $K = 0.25 + \frac{15}{\sqrt{6400}}$	0.44 > 0.4 for	two	floors
6. LL = 100*0.44	44.00		
7. Alternative LL			
$0.7(L_1 + L_2 + L_3 +$)=0.7*100	70.00 ← Controls		

2.8

1. Total load = 30+25+20, psf	75.00		
2. A_T = 25x30	750.00		
3. K_{LL}	2.00		
4. $K_{LL}A_T$	1500.00		
5. $K = 0.25 + \frac{15}{\sqrt{1500}}$	0.64		
6. LL = 75*0.64	48.00		
7. Alternative LL			
$0.7(L_1 + L_2 + L_3 +$)			
0.7 (30+ 25 + 20)	52.50 ←Controls		
8. Min LL = Max on a floor = 30			

2.9

1. LL = L (1 + IF)
2. IF = 1 for Elevator
   = 0.33 for Hanger — 1.33
3. LL = 52.5 (1 + 1.33) — 122.325

2.10

1. For gymnasium L_o, psf	100.00
2. A_T = 50 x 20	1000.00
3. For interior beam K_{LL}	2.00
4. $K_{LL}A_T$	2000.00
5. $K = 0.25 + \frac{15}{\sqrt{2000}}$	0.585
6. LL = 100*0.585	58.54
7. Design Load	
LL	58.54
Impact factor 50%	29.27
Partition load	15.00
Total	102.81

2.11

1. Roof live load L_0, psf	20.00
2. Roof angle θ= tan-1 (6.3/10)	32.23
3. Horizontal dist = W*cosθ	20.31
4. A_T = 10 x 20.31	203.10
5. R1 = 1.2 - 0.001*A_T	1.00
6. R2 = 1.2 - 0.6*tanθ	0.82
7. L_r = R1*R2*L_0	16.39

2.12

1. Roof live load L_0, psf	20.00		
2. Roof angle θ= tan-1 (6.3/10)	32.23		
3. Horizontal dist = W*cosθ	20.31		
4. A_T = 4 x 20.31	81.22	<200 ft^2	R1 =1
5. Since A_T < 200 R1 =1	1.00		
6. R2 = 1.2 - 0.6*tanθ	0.82		
7. L_r = R1*R2*L_0	16.44		

2.13

1. Roof live load L_0, psf	20		
2. Roof angle θ= tan-1 (1/2)	26.57		
3. Horizontal dist = W	15		
4. A_T = 15*40	600		
5. R1 = 1.2 - 0.001*A_T	0.6		
6. R2 = 1.2 - 0.6*tanθ	0.90		
7. L_r = R1*R2*L_0	10.80	< 12 psf	Use 12
8. Minimum roof live load	12.00	psf	

2.14

1. Roof live load L_0, psf	20.00	
2. Roof angle θ= tan-1 (1/2)	26.57	
3. Horizontal wall dist = W	7.50	
4. A_T = 7.5*40	300.00	
5. R1 = 1.2 - 0.001*A_T	0.90	
6. R2 = 1.2 - 0.6*tanθ	0.90	
7. L_r = R1*R2*L_0	16.20	

2.15

Special roof live load are not reduced by roof live load reductions R1 and R2. However, these will be reduced by the provisions of floor live loads

1. For garden roof L_o, psf	100.00
2. A_T = 250	250.00
3. K_{LL}	4.00
4. $K_{LL}A_T$	1000.00
5. K = 0.25 + 15 / √1000	0.724
L_r = 100*0.72	72.43