

Reinforced Concrete Moment Frame Archetype Overview

- Perimeter Frame Layout (LFRS around entire perimeter of building, gravity system elsewhere)
- 20ft bay spacing, 6 bays x 6 bays, 120' x 120' in plan (only three bays of the structural frame are modeled)
- 15ft first story height, 13ft elsewhere
- 8" flat gravity slab

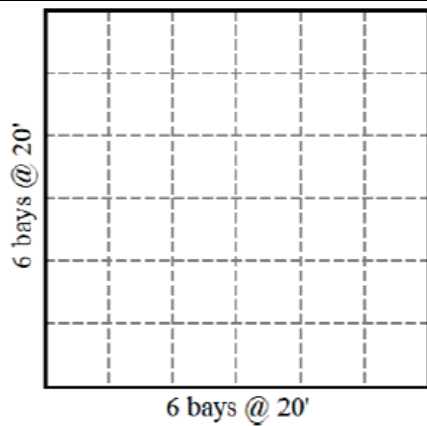


Figure 1. Plan view of the Perimeter Frame Building

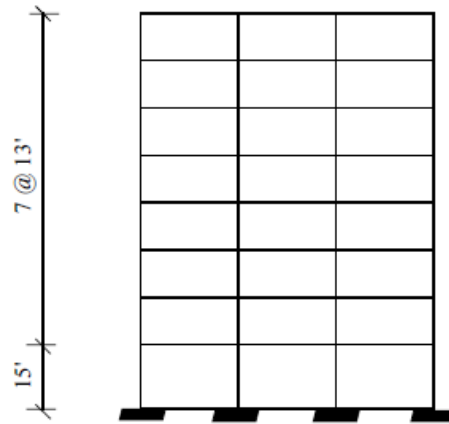


Figure 2. Elevation view of the 3 bays of the perimeter frame building

8-Story Special RCMF Design Summary: Baseline

Level	Columns depth x width [tie spacing] (ρ_{total} , ρ_{sh})		Beams depth x width [hoop spacing] (ρ_{top} , ρ_{bot} , ρ_{sh})	
	Exterior	Interior	Exterior	Interior
8	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0109, 0.0093)	30x24 [6] (0.0066, 0.0036, 0.0027)	30x24 [6] (0.0066, 0.0036, 0.0027)
7	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0109, 0.0093)	30x24 [5.5] (0.0066, 0.0036, 0.0030)	30x24 [5.5] (0.0066, 0.0036, 0.0030)
6	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0109, 0.0093)	30x24 [5.5] (0.0066, 0.0036, 0.0030)	30x24 [5.5] (0.0066, 0.0036, 0.0030)
5	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0153, 0.0093)	30x24 [5] (0.0066, 0.0045, 0.0033)	30x24 [5] (0.0066, 0.0045, 0.0033)
4	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0153, 0.0093)	36x24 [5] (0.0061, 0.0037, 0.0033)	36x24 [5] (0.0061, 0.0037, 0.0033)
3	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0153, 0.0093)	36x24 [4.5] (0.0061, 0.0045, 0.0036)	36x24 [4.5] (0.0061, 0.0045, 0.0036)
2	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0153, 0.0093)	36x24 [4.5] (0.0061, 0.0045, 0.0036)	36x24 [4.5] (0.0061, 0.0045, 0.0036)
1	30x24 [3.5] (0.0153, 0.0093)	30x24 [3.5] (0.0153, 0.0093)	36x24 [4.5] (0.0061, 0.0045, 0.0036)	36x24 [4.5] (0.0061, 0.0045, 0.0036)

8-Story Special RCMF Design Summary: $I_e = 1.25$

Level	Columns depth x width [tie spacing] (ρ_{total} , ρ_{sh})		Beams depth x width [hoop spacing] (ρ_{top} , ρ_{bot} , ρ_{sh})	
	Exterior	Interior	Exterior	Interior
8	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0109, 0.0093)	30x24 [6] (0.0066, 0.0036, 0.0027)	30x24 [6] (0.0066, 0.0036, 0.0027)
7	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0109, 0.0093)	30x24 [5.5] (0.0066, 0.0036, 0.0030)	30x24 [5.5] (0.0066, 0.0036, 0.0030)
6	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0131, 0.0093)	30x24 [5] (0.0066, 0.0045, 0.0033)	30x24 [5] (0.0066, 0.0045, 0.0033)
5	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0131, 0.0093)	30x24 [4.5] (0.0075, 0.0055, 0.0036)	30x24 [4.5] (0.0075, 0.0055, 0.0036)
4	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0145, 0.0093)	36x24 [4] (0.0069, 0.0052, 0.0041)	36x24 [4] (0.0069, 0.0052, 0.0041)
3	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0145, 0.0093)	36x24 [4] (0.0069, 0.0052, 0.0041)	36x24 [4] (0.0069, 0.0052, 0.0041)
2	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0145, 0.0093)	36x24 [4] (0.0069, 0.0052, 0.0041)	36x24 [4] (0.0069, 0.0052, 0.0041)
1	36x24 [3.5] (0.0164, 0.0093)	36x24 [3.5] (0.0145, 0.0093)	36x24 [4.5] (0.0061, 0.0052, 0.0036)	36x24 [4.5] (0.0061, 0.0052, 0.0036)

8-Story Special RCMF Design Summary: $I_e = 1.5$

Level	Columns depth x width [tie spacing] (ρ_{total} , ρ_{sh})		Beams depth x width [hoop spacing] (ρ_{top} , ρ_{bot} , ρ_{sh})	
	Exterior	Interior	Exterior	Interior
8	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0131, 0.0093)	30x24 [6] (0.0066, 0.0036, 0.0027)	30x24 [6] (0.0066, 0.0036, 0.0027)
7	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0131, 0.0093)	30x24 [5.5] (0.0066, 0.0036, 0.0030)	30x24 [5.5] (0.0066, 0.0036, 0.0030)
6	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0131, 0.0093)	30x24 [4.5] (0.0075, 0.0055, 0.0036)	30x24 [4.5] (0.0075, 0.0055, 0.0036)
5	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0145, 0.0093)	30x24 [4] (0.0083, 0.0064, 0.0041)	30x24 [4] (0.0083, 0.0064, 0.0041)
4	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0145, 0.0093)	36x24 [3.5] (0.0076, 0.0060, 0.0047)	36x24 [3.5] (0.0076, 0.0060, 0.0047)
3	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0145, 0.0093)	36x24 [3.5] (0.0076, 0.0060, 0.0047)	36x24 [3.5] (0.0076, 0.0060, 0.0047)
2	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0145, 0.0093)	36x24 [3.5] (0.0076, 0.0060, 0.0047)	36x24 [3.5] (0.0076, 0.0060, 0.0047)
1	36x24 [3.5] (0.0200, 0.0093)	36x24 [3.5] (0.0145, 0.0093)	36x24 [4] (0.0069, 0.0052, 0.0041)	36x24 [4] (0.0069, 0.0052, 0.0041)

8-Story Special RCMF Design Summary: 1.5% Drift Limit

Level	Columns depth x width [tie spacing] (ρ_{total} , ρ_{sh})		Beams depth x width [hoop spacing] (ρ_{top} , ρ_{bot} , ρ_{sh})	
	Exterior	Interior	Exterior	Interior
8	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0109, 0.0093)	30x24 [6] (0.0066, 0.0036, 0.0027)	30x24 [6] (0.0066, 0.0036, 0.0027)
7	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0109, 0.0093)	30x24 [5.5] (0.0066, 0.0036, 0.0030)	30x24 [5.5] (0.0066, 0.0036, 0.0030)
6	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0109, 0.0093)	30x24 [5.5] (0.0066, 0.0036, 0.0030)	30x24 [5.5] (0.0066, 0.0036, 0.0030)
5	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0153, 0.0093)	30x24 [5] (0.0066, 0.0045, 0.0033)	30x24 [5] (0.0066, 0.0045, 0.0033)
4	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0153, 0.0093)	36x24 [5] (0.0061, 0.0037, 0.0033)	36x24 [5] (0.0061, 0.0037, 0.0033)
3	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0153, 0.0093)	36x24 [4.5] (0.0061, 0.0045, 0.0036)	36x24 [4.5] (0.0061, 0.0045, 0.0036)
2	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0153, 0.0093)	36x24 [4.5] (0.0061, 0.0045, 0.0036)	36x24 [4.5] (0.0061, 0.0045, 0.0036)
1	30x24 [3.5] (0.0153, 0.0093)	30x24 [3.5] (0.0153, 0.0093)	36x24 [4.5] (0.0061, 0.0045, 0.0036)	36x24 [4.5] (0.0061, 0.0045, 0.0036)

8-Story Special RCMF Design Summary: 1% Drift Limit

Level	Columns depth x width [tie spacing] (ρ_{total} , ρ_{sh})		Beams depth x width [hoop spacing] (ρ_{top} , ρ_{bot} , ρ_{sh})	
	Exterior	Interior	Exterior	Interior
8	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0109, 0.0093)	30x24 [6] (0.0066, 0.0036, 0.0027)	30x24 [6] (0.0066, 0.0036, 0.0027)
7	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0109, 0.0093)	30x24 [5.5] (0.0066, 0.0036, 0.0030)	30x24 [5.5] (0.0066, 0.0036, 0.0030)
6	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0145, 0.0093)	36x24 [5] (0.0061, 0.0037, 0.0033)	36x24 [5] (0.0061, 0.0037, 0.0033)
5	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0145, 0.0093)	36x24 [5] (0.0061, 0.0037, 0.0033)	36x24 [5] (0.0061, 0.0037, 0.0033)
4	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0145, 0.0093)	42x24 [4] (0.0064, 0.0038, 0.0041)	42x24 [4] (0.0064, 0.0038, 0.0041)
3	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0145, 0.0093)	42x24 [4] (0.0064, 0.0038, 0.0041)	42x24 [4] (0.0064, 0.0038, 0.0041)
2	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0145, 0.0093)	42x24 [4] (0.0064, 0.0038, 0.0041)	42x24 [4] (0.0064, 0.0038, 0.0041)
1	36x24 [3.5] (0.0127, 0.0093)	36x24 [3.5] (0.0145, 0.0093)	42x24 [4] (0.0064, 0.0038, 0.0041)	42x24 [4] (0.0064, 0.0038, 0.0041)

8-Story Special RCMF Design Summary: Risk Category IV

Level	Columns depth x width [tie spacing] (ρ_{total} , ρ_{sh})		Beams depth x width [hoop spacing] (ρ_{top} , ρ_{bot} , ρ_{sh})	
	Exterior	Interior	Exterior	Interior
8	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0109, 0.0093)	30x24 [6] (0.0066, 0.0036, 0.0027)	30x24 [6] (0.0066, 0.0036, 0.0027)
7	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0109, 0.0093)	30x24 [5.5] (0.0066, 0.0036, 0.0030)	30x24 [5.5] (0.0066, 0.0036, 0.0030)
6	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0164, 0.0093)	36x24 [4.5] (0.0061, 0.0045, 0.0036)	36x24 [4.5] (0.0061, 0.0045, 0.0036)
5	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0164, 0.0093)	36x24 [4] (0.0069, 0.0052, 0.0041)	36x24 [4] (0.0069, 0.0052, 0.0041)
4	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0164, 0.0093)	42x24 [3.5] (0.0064, 0.0051, 0.0047)	42x24 [3.5] (0.0064, 0.0051, 0.0047)
3	36x24 [3.5] (0.0127, 0.0093)	36x24 [3.5] (0.0164, 0.0093)	42x24 [3.5] (0.0064, 0.0051, 0.0047)	42x24 [3.5] (0.0064, 0.0051, 0.0047)
2	36x24 [3.5] (0.0127, 0.0093)	36x24 [3.5] (0.0164, 0.0093)	42x24 [3.5] (0.0064, 0.0057, 0.0047)	42x24 [3.5] (0.0064, 0.0057, 0.0047)
1	36x24 [3.5] (0.0200, 0.0093)	36x24 [3.5] (0.0164, 0.0093)	42x24 [3.5] (0.0064, 0.0051, 0.0047)	42x24 [3.5] (0.0064, 0.0051, 0.0047)