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, 180' x 180' in plan (only three bays of the structural frame are modeled)

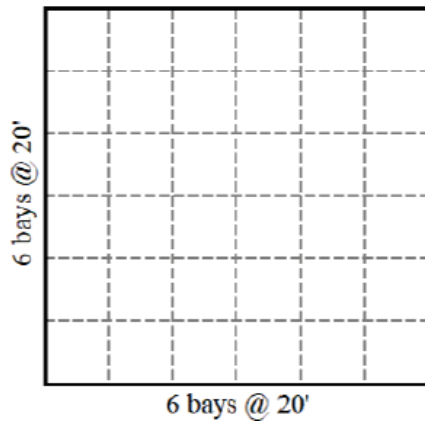- 15ft first story height, 13ft elsewhere

- 8" flat gravity slab

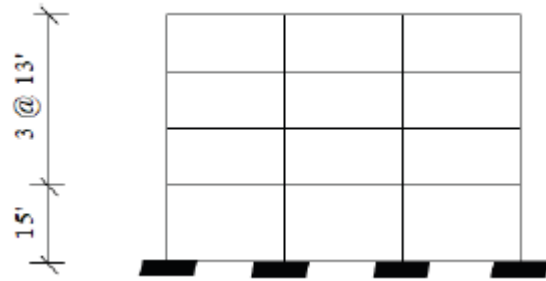

Figure 1. Plan view of the Perimeter Frame Building

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

4-Story Special RCMF Design Summary: Baseline

	Columns		Beams	
	depth x width [tie spacing]		depth x width [hoop spacing]	
	$(\rho_{total}, \rho_{sh})$		$(\rho_{top}, \rho_{bot}, \rho_{sh})$	
Level	Exterior	Interior	Exterior	Interior
4	24x24 [2.5]	24x24 [2.5]	24x24 [5]	24x24 [5]
	(0.0109, 0.0098)	(0.0109, 0.0098)	(0.0073, 0.0046, 0.0033)	(0.0073, 0.0046, 0.0033)
3	24x24 [2.5]	24x24 [2.5]	24x24 [5]	24x24 [5]
	(0.0109, 0.0098)	(0.0136, 0.0098)	(0.0073, 0.0046, 0.0033)	(0.0073, 0.0046, 0.0033)
2	30x24 [3.5]	30x24 [3.5]	30x24 [4.5]	30x24 [4.5]
	(0.0109, 0.0093)	(0.0175, 0.0093)	(0.0066, 0.0055, 0.0036)	(0.0066, 0.0055, 0.0036)
1	30x24 [3.5]	30x24 [3.5]	30x24 [5]	30x24 [5]
	(0.0153, 0.0093)	(0.0175, 0.0093)	(0.0066, 0.0045, 0.0033)	(0.0066, 0.0045, 0.0033)

4-Story Special RCMF Design Summary: Ie = 1.25

	Columns		Beams	
	depth x width [tie spacing]		depth x width [hoop spacing]	
	$(\rho_{total}, \rho_{sh})$		$(\rho_{top}, \rho_{bot}, \rho_{sh})$	
Level	Exterior	Interior	Exterior	Interior
4	30x30 [2]	30x30 [2]	24x24 [5]	24x24 [5]
	(0.0105, 0.0098)	(0.0105, 0.0098)	(0.0072, 0.0046, 0.0033)	(0.0072, 0.0046, 0.0033)
3	30x30 [2]	30x30 [2]	24x24 [5]	24x24 [5]
	(0.0105, 0.0098)	(0.0105, 0.0098)	(0.0084, 0.0046, 0.0033)	(0.0084, 0.0046, 0.0033)
2	30x30 [2.5]	30x30 [2.5]	30x24 [4]	30x24 [4]
	(0.0105, 0.0105)	(0.0140, 0.0105)	(0.0084, 0.0064, 0.0041)	(0.0084, 0.0064, 0.0041)
1	30x30 [2.5]	30x30 [2.5]	30x24 [4.5]	30x24 [4.5]
	(0.0157, 0.0105)	(0.0140, 0.0105)	(0.0075, 0.0055, 0.0036)	(0.0075, 0.0055, 0.0036)

4-Story Special RCMF Design Summary: Ie = 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
4	30x30 [2] (0.0105, 0.0098)	30x30 [2] (0.0105, 0.0098)	24x24 [5] (0.0072, 0.0046, 0.0033)	24x24 [5] (0.0072, 0.0046, 0.0033)
3	30x30 [2] (0.0105, 0.0098)	30x30 [2] (0.0105, 0.0098)	24x24 [4.5] (0.0095, 0.0058, 0.0036)	24x24 [4.5] (0.0095, 0.0058, 0.0036)
2	30x30 [2.5] (0.0105, 0.0105)	30x30 [2.5] (0.0175, 0.0105)	30x24 [3.5] (0.0093, 0.0073, 0.0047)	30x24 [3.5] (0.0093, 0.0073, 0.0047)
1	30x30 [2.5] (0.0192, 0.0105)	30x30 [2.5] (0.0175, 0.0105)	30x24 [4] (0.0084, 0.0064, 0.0041)	30x24 [4] (0.0084, 0.0064, 0.0041)

4-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
4	30x24 [2.5] (0.0109, 0.0098)	30x24 [2.5] (0.0109, 0.0098)	24x24 [5] (0.0072, 0.0046, 0.0033)	24x24 [5] (0.0072, 0.0046, 0.0033)
3	30x24 [2.5] (0.0109, 0.0098)	30x24 [2.5] (0.0109, 0.0098)	24x24 [5] (0.0072, 0.0046, 0.0033)	24x24 [5] (0.0072, 0.0046, 0.0033)
2	30x24 [3.5] (0.0109, 0.0093)	30x24 [3.5] (0.0175, 0.0093)	30x24 [4.5] (0.0066, 0.0055, 0.0036)	30x24 [4.5] (0.0066, 0.0055, 0.0036)
1	30x24 [3.5] (0.0153, 0.0093)	30x24 [3.5] (0.0175, 0.0093)	30x24 [5] (0.0066, 0.0045, 0.0033)	30x24 [5] (0.0066, 0.0045, 0.0033)

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

	Columns depth x width [tie spacing] (ρ_{total}, ρ_{sh})		Beams depth x width [hoop spacing] (ρ_{top}, ρ_{bot}, ρ_{sh})	
Level	Exterior	Interior	Exterior	Interior
4	36x24 [2.5] (0.0109, 0.0098)	36x24 [2.5] (0.0109, 0.0098)	36x24 [5] (0.0061, 0.0037, 0.0033)	36x24 [5] (0.0061, 0.0037, 0.0033)
3	36x24 [2.5] (0.0109, 0.0098)	36x24 [2.5] (0.0109, 0.0098)	36x24 [5] (0.0061, 0.0037, 0.0033)	36x24 [5] (0.0061, 0.0037, 0.0033)
2	36x24 [3.5] (0.0109, 0.0093)	36x24 [3.5] (0.0109, 0.0093)	36x24 [5] (0.0061, 0.0037, 0.0033)	36x24 [5] (0.0061, 0.0037, 0.0033)
1	36x24 [3.5] (0.0127, 0.0093)	36x24 [3.5] (0.0109, 0.0093)	36x24 [5] (0.0061, 0.0037, 0.0033)	36x24 [5] (0.0061, 0.0037, 0.0033)

4-Story Special RCMF Design Summary: Risk Category IV

	Columns depth x width [tie spacing] (ρ_{total}, ρ_{sh})		Beams depth x width [hoop spacing] (ρ_{top}, ρ_{bot}, ρ_{sh})	
Level	Exterior	Interior	Exterior	Interior
4	36x24 [2.5] (0.0109, 0.0098)	36x24 [2.5] (0.0109, 0.0098)	36x24 [5] (0.0061, 0.0037, 0.0033)	36x24 [5] (0.0061, 0.0037, 0.0033)
3	36x24 [2.5] (0.0109, 0.0098)	36x24 [2.5] (0.0109, 0.0098)	36x24 [5] (0.0061, 0.0037, 0.0033)	36x24 [5] (0.0061, 0.0037, 0.0033)
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] (0.0182, 0.0093)	36x24 [3.5] (0.0182, 0.0093)	36x24 [4] (0.0069, 0.0052, 0.0041)	36x24 [4] (0.0069, 0.0052, 0.0041)