

SUMMARY OF RDA RESULTS TO RC SHEAR ELEMENTS - LEVEL 2
ASCE 7-10 SECTION 12.8 - EQUIVALENT LATERAL FORCE PROCEDURE - RIGID DIAPHRAGM ANALYSIS
SAMPLE PROJECT, ANYTOWN - NEW DESIGN

Floor Level : 2

1. General Design Parameters

Story Shear - N-S Direction (Y) for Loading Direction = + (+/-)
 LFRS System: RC SMRF $V_s = 1,323$ kips (Story Shear)
 $C_s = 0.079$ g's (Seismic Coefficient)

Story Shear - W-E Direction (X) for Loading Direction = + (+/-)
 LFRS System: RC SMRF $V_s = 1,323$ kips (Story Shear)
 $C_s = 0.079$ g's (Seismic Coefficient)

Moment Frame Beams - N-S Direction (Y) **Moment Frame Beams - W-E Direction (X)**
 $b = 20.00$ inches $b = 20.00$ inches
 $d = 24.00$ inches $d = 24.00$ inches

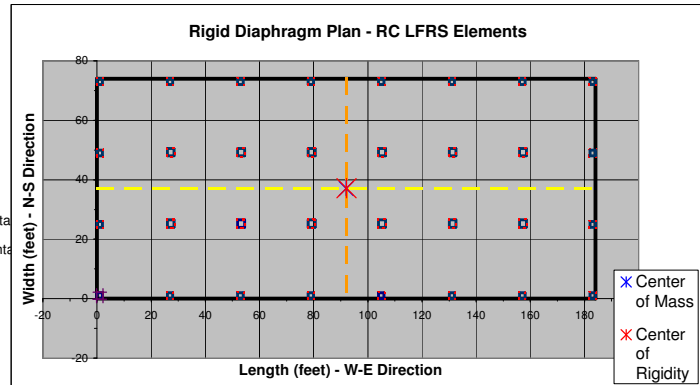
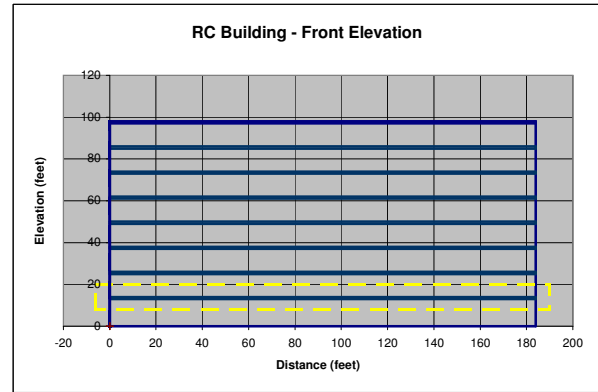
RC Diaphragm Dimensions						
Section	Length (feet)	Width (feet)	Thickness (inches)	x (feet)	y (feet)	Weight (kips)
1	184.00	74.00	12.00	-	-	1,906
2						
3						

for $\rho = 140$ pcf (Unit Weight)

Accidental Eccentricity (ASCE Section 12.8.4.2):

$e_{MIN} = 5.00$ % (accidental eccentricity)
 $=> e_{AX} A_{XY} = 3.70$ feet for $A_{XY} = 1.00$ (N-S Amplification of Accidental)
 $e_{AY} A_{XX} = 9.20$ feet $A_{XX} = 1.00$ (W-E Amplification of Accidental)

Material Data: $f'_c = 4.00$ Ksi (Compressive Strength - Concrete)
 $E_m =$ Ksi (Modulus of Rupture - Masonry)
 $=> E_c = 3,605$ ksi



2. RDA Load Distribution to RC Elements - Summary of Results

LFRS Direction	RC Element ID	RC Element Dimensions and Data										V_c (kips)	Deformation		Axial Forces from Overturning		
		RC LFRS		Dimensions				Coordinates		Stiffness			Total Drift Ratio	δ_{ns} (inches)	P_{WE} (Kips)	P_{NS} (Kips)	P_{OT} (Kips)
		Shear Wall	SMRF Column	H_{below} (feet)	H_{above} (feet)	L (feet)	t (inches)	x (feet)	y (feet)	K (kip/in)	Relative Stiffness						
N-S	1	x		14.00	12.00	2.00	24.0	0.00	0.00	75	1.00	30.7	0.0026	0.460		165	165
	2	x		14.00	12.00	2.00	24.0	26.00	0.00	75	1.00	30.1	0.0026	0.451		165	165
	3	x		14.00	12.00	2.00	24.0	52.00	0.00	75	1.00	29.4	0.0025	0.441		165	165
	4	x		14.00	12.00	2.00	24.0	78.00	0.00	75	1.00	28.7	0.0025	0.431		165	165
	5	x		14.00	12.00	2.00	24.0	104.00	0.00	75	1.00	28.1	0.0024	0.421		165	165
	6	x		14.00	12.00	2.00	24.0	130.00	0.00	75	1.00	27.4	0.0023	0.411		165	165
	7	x		14.00	12.00	2.00	24.0	156.00	0.00	75	1.00	26.8	0.0023	0.401		165	165
	8	x		14.00	12.00	2.00	24.0	182.00	0.00	75	1.00	26.1	0.0022	0.392		165	165
	9	x		14.00	12.00	2.00	24.0	0.00	24.00	131	1.75	53.2	0.0026	0.495			
	10	x		14.00	12.00	2.50	30.0	26.00	24.00	154	2.05	61.4	0.0026	0.440			
	11	x		14.00	12.00	2.50	30.0	52.00	24.00	154	2.05	60.0	0.0025	0.431			
	12	x		14.00	12.00	2.50	30.0	78.00	24.00	154	2.05	58.7	0.0024	0.421			
	13	x		14.00	12.00	2.50	30.0	104.00	24.00	154	2.05	57.3	0.0024	0.411			
	14	x		14.00	12.00	2.50	30.0	130.00	24.00	154	2.05	56.0	0.0023	0.402			
	15	x		14.00	12.00	2.50	30.0	156.00	24.00	154	2.05	54.6	0.0023	0.392			
	16	x		14.00	12.00	2.00	24.0	182.00	24.00	131	1.75	45.2	0.0022	0.420			
	17	x		14.00	12.00	2.00	24.0	0.00	48.00	131	1.75	53.2	0.0026	0.495			
	18	x		14.00	12.00	2.50	30.0	26.00	48.00	154	2.05	61.4	0.0026	0.440			
	19	x		14.00	12.00	2.50	30.0	52.00	48.00	154	2.05	60.0	0.0025	0.431			
	20	x		14.00	12.00	2.50	30.0	78.00	48.00	154	2.05	58.7	0.0024	0.421			
	21	x		14.00	12.00	2.50	30.0	104.00	48.00	154	2.05	57.3	0.0024	0.411			
	22	x		14.00	12.00	2.50	30.0	130.00	48.00	154	2.05	56.0	0.0023	0.402			
	23	x		14.00	12.00	2.50	30.0	156.00	48.00	154	2.05	54.6	0.0023	0.392			
	24	x		14.00	12.00	2.00	24.0	182.00	48.00	131	1.75	45.2	0.0022	0.420			
	25	x		14.00	12.00	2.00	24.0	0.00	72.00	75	1.00	30.7	0.0026	0.460		-164	-164
	26	x		14.00	12.00	2.00	24.0	26.00	72.00	75	1.00	30.1	0.0026	0.451		-164	-164
	27	x		14.00	12.00	2.00	24.0	52.00	72.00	75	1.00	29.4	0.0025	0.441		-164	-164
	28	x		14.00	12.00	2.00	24.0	78.00	72.00	75	1.00	28.7	0.0025	0.431		-164	-164
	29	x		14.00	12.00	2.00	24.0	104.00	72.00	75	1.00	28.1	0.0024	0.421		-164	-164
	30	x		14.00	12.00	2.00	24.0	130.00	72.00	75	1.00	27.4	0.0023	0.411		-164	-164
	31	x		14.00	12.00	2.00	24.0	156.00	72.00	75	1.00	26.8	0.0023	0.401		-164	-164
	32	x		14.00	12.00	2.00	24.0	182.00	72.00	75	1.00	26.1	0.0022	0.392		-164	-164

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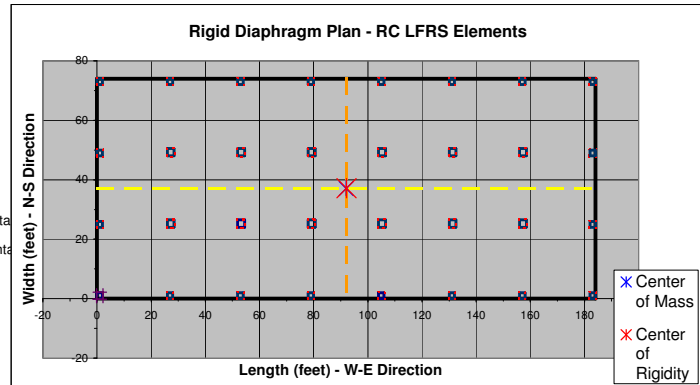
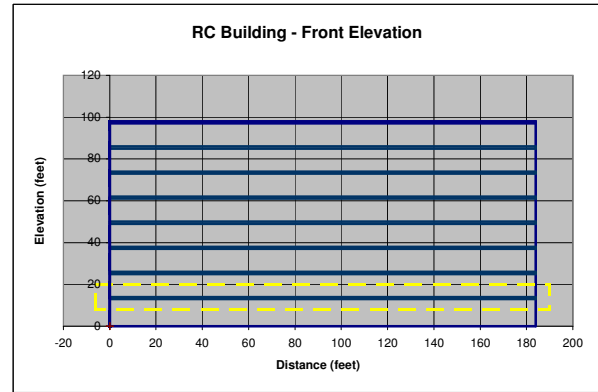
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2. RDA Load Distribution to RC Elements - Summary of Results

LFRS W-E	RC	RC LFRS		RC Element Dimensions and Data								v	Deformation		Axial Forces from Overturning	
				Dimensions				Coordinates		Stiffness						
	1	x		14.00	12.00	2.00	24.00	0.00	0.00	75	1.00	23.1	0.0020	0.346	130	130
	2	x		14.00	12.00	2.00	24.00	26.00	0.00	131	1.75	39.9	0.0019	0.371		
	3	x		14.00	12.00	2.00	24.00	52.00	0.00	131	1.75	39.9	0.0019	0.371		
	4	x		14.00	12.00	2.00	24.00	78.00	0.00	131	1.75	39.9	0.0019	0.371		
	5	x		14.00	12.00	2.00	24.00	104.00	0.00	131	1.75	39.9	0.0019	0.371		
	6	x		14.00	12.00	2.00	24.00	130.00	0.00	131	1.75	39.9	0.0019	0.371		
	7	x		14.00	12.00	2.00	24.00	156.00	0.00	131	1.75	39.9	0.0019	0.371		
	8	x		14.00	12.00	2.00	24.00	182.00	0.00	75	1.00	23.1	0.0020	0.346	-130	-130
	9	x		14.00	12.00	2.00	24.00	0.00	24.00	75	1.00	24.6	0.0021	0.368	130	130
	10	x		14.00	12.00	2.50	30.00	26.00	24.00	154	2.05	50.2	0.0021	0.360		
	11	x		14.00	12.00	2.50	30.00	52.00	24.00	154	2.05	50.2	0.0021	0.360		
	12	x		14.00	12.00	2.50	30.00	78.00	24.00	154	2.05	50.2	0.0021	0.360		
	13	x		14.00	12.00	2.50	30.00	104.00	24.00	154	2.05	50.2	0.0021	0.360		
	14	x		14.00	12.00	2.50	30.00	130.00	24.00	154	2.05	50.2	0.0021	0.360		
	15	x		14.00	12.00	2.50	30.00	156.00	24.00	154	2.05	50.2	0.0021	0.360		
	16	x		14.00	12.00	2.00	24.00	182.00	24.00	75	1.00	24.6	0.0021	0.368	-130	-130
	17	x		14.00	12.00	2.00	24.00	0.00	48.00	75	1.00	26.0	0.0022	0.390	130	130
	18	x		14.00	12.00	2.50	30.00	26.00	48.00	154	2.05	53.2	0.0022	0.382		
	19	x		14.00	12.00	2.50	30.00	52.00	48.00	154	2.05	53.2	0.0022	0.382		
	20	x		14.00	12.00	2.50	30.00	78.00	48.00	154	2.05	53.2	0.0022	0.382		
	21	x		14.00	12.00	2.50	30.00	104.00	48.00	154	2.05	53.2	0.0022	0.382		
	22	x		14.00	12.00	2.50	30.00	130.00	48.00	154	2.05	53.2	0.0022	0.382		
	23	x		14.00	12.00	2.50	30.00	156.00	48.00	154	2.05	53.2	0.0022	0.382		
	24	x		14.00	12.00	2.00	24.00	182.00	48.00	75	1.00	26.0	0.0022	0.390	-130	-130
	25	x		14.00	12.00	2.00	24.00	0.00	72.00	75	1.00	27.5	0.0023	0.413	130	130
	26	x		14.00	12.00	2.00	24.00	26.00	72.00	131	1.75	47.6	0.0023	0.443		
	27	x		14.00	12.00	2.00	24.00	52.00	72.00	131	1.75	47.6	0.0023	0.443		
	28	x		14.00	12.00	2.00	24.00	78.00	72.00	131	1.75	47.6	0.0023	0.443		
	29	x		14.00	12.00	2.00	24.00	104.00	72.00	131	1.75	47.6	0.0023	0.443		
	30	x		14.00	12.00	2.00	24.00	130.00	72.00	131	1.75	47.6	0.0023	0.443		
	31	x		14.00	12.00	2.00	24.00	156.00	72.00	131	1.75	47.6	0.0023	0.443		
	32	x		14.00	12.00	2.00	24.00	182.00	72.00	75	1.00	27.5	0.0023	0.413	-130	-130