

APPENDIX A: DETAILS OF THE MODAL DDBD CASE STUDY

The Appendix includes tables related to the case study presented in section 3.3 '*Modal Direct Displacement-Based Design (MDDBD)*', presenting details of selected steps of the design iterations.

Table A1. Loop 1, Design Iterations 1, 3 & 4.

Member	Abt ₁	Col ₁	Col ₂	Abt ₂	Sum	Member	Abt ₁	Col ₁	Col ₂	Abt ₂	Sum	Member	Abt ₁	Col ₁	Col ₂	Abt ₂	Sum	
<i>1st Iteration - EMS.1</i>						<i>1st Iteration - EMS.1 (Mode 1)</i>						<i>1st Iteration - EMS.1 (Mode 2)</i>						
h _{eq,i} (m)		3.50	4.50			h _{eq,i} (m)		3.72	4.50			h _{eq,i2} (m)		3.50	4.68			
x _{k,i} (%)		50.0	50.0			x _{k,i} (%)		53.1	50.0			x _{k,i2} (%)		50.0	59.0			
x _{Δy,i} (%)		50.0	50.0			x _{Δy,i} (%)		54.9	50.0			x _{Δy,i2} (%)		50.0	60.3			
K _{g,i} (kN/m)		271449.1	128145.5			K _{g,i} (kN/m)		240413.1	128145.5			K _{g,i2} (kN/m)		271449.1	134241.3			
K _{eff,i} /K _{g,i} (%)		10.0	10.0			K _{eff,i} /K _{g,i} (%)		10.0	10.0			K _{eff,i2} /K _{g,i2} (%)		10.0	10.0			
δ _i (m)	0.126	0.089	0.153	0.216		u _{i,1} (m)	-0.014	0.049	0.153	0.209		u _{i,2} (m)	0.125	0.075	-0.005	-0.055		
Δ _i (m)	0.102	0.073	0.124	0.176		U _{i,1} (m)	-0.011	0.040	0.124	0.170		U _{i,2} (m)	0.102	0.061	-0.004	-0.045		
Δ _{sys} (m)		0.116				Δ _{sys,1} (m)		0.118				Δ _{sys,2} (m)		0.094				
M _{sys} (tn)		2360.35	(92% of participating mass)			M _{sys,1} (tn)		1790.08	(69,8% of particip. mass)			M _{sys,2} (tn)		775.51	(30,2% of particip. mass)			
Δ _{y,i} (m)		0.036	0.057			Δ _{y,i} (m)		0.036	0.057			Δ _{y,i2} (m)		0.036	0.051			
μ _{Δ,i}		2.04	2.19			μ _{Δ,i}		1.11	2.19			μ _{Δ,i2}		1.70	0.08			
ξ _{si} (%)	5.0	13.1	13.6	5.0		ξ _{si} (%)	5.0	6.5	13.6	5.0		ξ _{si2} (%)	5.0	11.6	5.0	5.0		
x (%) = F _{abt} /V _B		33.8				x ₁ (%) = F _{abt,1} /V _{B,1}		24.8				x ₂ (%) = F _{abt,2} /V _{B,2}		16.9				
Q _i = μ _{Δ,i} (Δ _i /h _{eq,i})		0.021	0.028		0.048	Q _{i,1} = μ _{Δ,i} (U _{i,1} /h _{eq,i1})		0.011	0.028		0.039	Q _{i,2} = μ _{Δ,i2} (U _{i,2} /h _{eq,i2})		0.017	0.000		0.017	
(1-x)(Q _i /ΣQ _k)		0.284	0.378		0.662	(1-x ₁)(Q _{i,1} /ΣQ _{k,1})		0.221	0.531		0.752	(1-x ₂)(Q _{i,2} /ΣQ _{k,2})		0.835	-0.004		0.831	
ξ _{sys} (%)		10.6				ξ _{sys,1} (%)		9.9				ξ _{sys,2} (%)		10.5				
T _{eff} (sec)		1.62				T _{eff,1} (sec)		1.61				T _{eff,2} (sec)		1.30				
K _{eff} (kN/m)		35600.5				K _{eff,1} (kN/m)		27212.6				K _{eff,2} (kN/m)		18005.9				
V _B (kN)		4128.7				V _{B,1} (kN)		3211.3				V _{B,2} (kN)		1688.2				
V _i (kN)	512.1	1537.4	1197.1	882.0	4128.7	V _{i,1} (kN)	-55.8	1321.2	1092.8	853.1	3211.3	V _{i,2} (kN)	509.0	1497.5	-94.4	-223.9	1688.2	
K _{eff,i} (kN/m)	5011.4	21137.2	9624.0	5011.4		K _{eff,i1} (kN/m)	5011.4	32858.8	8790.4	5011.4		K _{eff,i2} (kN/m)	5011.4	24705.9	22073.6	5011.4		
K _{eff,i} /K _{g,i} (%)		7.79	7.51			K _{eff,i1} /K _{g,i1} (%)		13.67	6.86			K _{eff,i2} /K _{g,i2} (%)		9.10	16.44			
<i>3rd Iteration - EMS.3</i>						<i>3rd Iteration - EMS.3 (Mode 1)</i>						<i>3rd Iteration - EMS.3 (Mode 2)</i>						
K _{eff,i} /K _{g,i} (%)		8.27	7.73			K _{eff,i1} /K _{g,i1} (%)		13.01	7.49			K _{eff,i2} /K _{g,i2} (%)		10.77	17.57			
δ _i (m)	0.124	0.094	0.165	0.229		u _{i,1} (m)	-0.007	0.058	0.164	0.221		u _{i,2} (m)	0.124	0.073	-0.008	-0.058		
Δ _i (m)	0.095	0.072	0.127	0.176		U _{i,1} (m)	-0.005	0.045	0.127	0.170		U _{i,2} (m)	0.095	0.056	-0.006	-0.045		
Δ _{sys} (m)		0.117				Δ _{sys,1} (m)		0.118				Δ _{sys,2} (m)		0.093				
M _{sys} (tn)		2349.73	(91,6% of particip. mass)			M _{sys,1} (tn)		1862.58	(72,6% of particip. mass)			M _{sys,2} (tn)		702.87	(27,4% of particip. mass)			
μ _{Δ,i}		2.02	2.23			μ _{Δ,i}		1.23	2.22			μ _{Δ,i2}		1.59	0.12			
ξ _{si} (%)	5.0	13.05	13.77	5.0		ξ _{si} (%)	5.0	8.0	13.8	5.0		ξ _{si2} (%)	5.0	10.9	5.0	5.0		
x (%) = F _{abt} /V _B		31.9				x ₁ (%) = F _{abt,1} /V _{B,1}		23.5				x ₂ (%) = F _{abt,2} /V _{B,2}		14.4				
ξ _{sys} (%)		9.9				ξ _{sys,1} (%)		9.2				ξ _{sys,2} (%)		8.7				
T _{eff} (sec)		1.59				T _{eff,1} (sec)		1.57				T _{eff,2} (sec)		1.21				
K _{eff} (kN/m)		36652.3				K _{eff,1} (kN/m)		29771.5				K _{eff,2} (kN/m)		18983.1				
V _B (kN)		4270.1				V _{B,1} (kN)		3509.0				V _{B,2} (kN)		1756.5				
V _i (kN)	478.0	1636.1	1273.9	882.0	4270.1	V _{i,1} (kN)	-27.3	1468.4	1214.6	853.2	3509.0	V _{i,2} (kN)	477.3	1648.0	-145.1	-223.6	1756.5	
K _{eff,i} (kN/m)	5011.4	22707.1	10059.3	5011.4		K _{eff,i1} (kN/m)	5011.4	32830.9	9601.6	5011.4		K _{eff,i2} (kN/m)	5011.4	29173.7	24291.5	5011.4		
K _{eff,i} /K _{g,i} (%)		8.37	7.85			K _{eff,i1} /K _{g,i1} (%)		13.66	7.49			K _{eff,i2} /K _{g,i2} (%)		10.75	18.10			
<i>4th Iteration - EMS.4</i>						<i>4th Iteration - EMS.4 (Mode 1)</i>						<i>4th Iteration - EMS.4 (Mode 2)</i>						
δ _i (m)	0.124	0.093	0.164	0.228		u _{i,1} (m)	-0.008	0.058	0.164	0.220		u _{i,2} (m)	0.124	0.073	-0.008	-0.058		
Δ _i (m)	0.096	0.072	0.127	0.176		U _{i,1} (m)	-0.006	0.044	0.126	0.170		U _{i,2} (m)	0.096	0.057	-0.006	-0.045		
Δ _{sys} (m)		0.116				Δ _{sys,1} (m)		0.118				Δ _{sys,2} (m)		0.093				
M _{sys} (tn)		2350.33	(91,6% of particip. mass)			M _{sys,1} (tn)		1858.23	(72,4% of particip. mass)			M _{sys,2} (tn)		707.23	(27,6% of particip. mass)			
μ _{Δ,i}		2.02	2.22			μ _{Δ,i}		1.22	2.22			μ _{Δ,i2}		1.59	0.12			
ξ _{si} (%)	5.0	13.0	13.8	5.0		ξ _{si} (%)	5.0	7.9	13.8	5.0		ξ _{si2} (%)	5.0	10.9	5.0	5.0		
x (%) = F _{abt} /V _B		31.9				x ₁ (%) = F _{abt,1} /V _{B,1}		23.5				x ₂ (%) = F _{abt,2} /V _{B,2}		14.5				
ξ _{sys} (%)		9.9				ξ _{sys,1} (%)		9.2				ξ _{sys,2} (%)		8.7				
T _{eff} (sec)		1.59				T _{eff,1} (sec)		1.57				T _{eff,2} (sec)		1.21				
K _{eff} (kN/m)		36701.6				K _{eff,1} (kN/m)		29743.7				K _{eff,2} (kN/m)		19034.8				
V _B (kN)		4274.3				V _{B,1} (kN)		3505.6				V _{B,2} (kN)		1762.6				
V _i (kN)	480.0	1637.3	1274.9	882.0	4274.3	V _{i,1} (kN)	-29.0	1467.6	1213.9	853.2	3505.6	V _{i,2} (kN)	479.2	1650.1	-142.9	-223.7	1762.6	
K _{eff,i} (kN/m)	5011.4	22718.2	10078.0	5011.4		K _{eff,i1} (kN/m)	5011.4	33019.9	9606.2	5011.4		K _{eff,i2} (kN/m)	5011.4	29083.4	24322.1	5011.4		
K _{eff,i} /K _{g,i} (%)		8.37	7.86			K _{eff,i1} /K _{g,i1} (%)		13.73	7.50			K _{eff,i2} /K _{g,i2} (%)		10.71	18.12			

Table A2. Loop 2, Design Iterations 2 & 3, Structural Analyses (0.24g - D=1.5 m).

Member	Abt ₁	Col ₁	Col ₂	Abt ₂	Sum	Member	Abt ₁	Col ₁	Col ₂	Abt ₂	Sum	Member	Abt ₁	Col ₁	Col ₂	Abt ₂	Sum	
<i>2nd Iteration - EMS.2</i>						<i>2nd Iteration - EMS.2 (Mode 1)</i>						<i>2nd Iteration - EMS.2 (Mode 2)</i>						
h _{eq,i} (m)		3.54	4.50			h _{eq,i1} (m)		3.75	4.50			h _{eq,i2} (m)		3.50	4.34			
x _{k,i} (%)		50.6	50.0			x _{k,i1} (%)		53.5	50.0			x _{k,i2} (%)		50.0	54.7			
x _{Δy,i} (%)		52.5	50.0			x _{Δy,i1} (%)		55.3	50.0			x _{Δy,i2} (%)		50.0	56.2			
K _{g,i} (kN/m)		264752.1	128145.5			K _{g,i1} (kN/m)		236631.4	128145.5			K _{g,i2} (kN/m)		271449.1	156134.6			
K _{eff,i} /K _{g,i} (%)		7.71	7.60			K _{eff,i1} /K _{g,i1} (%)		7.9	10.0			K _{eff,i2} /K _{g,i2} (%)		10.8	33.4			
δ _i (m)	0.121	0.095	0.167	0.230		u _{i,1} (m)	-0.001	0.063	0.167	0.223		u _{i,2} (m)	0.121	0.071	-0.009	-0.059		
Δ _i (m)	0.092	0.073	0.128	0.176		U _{i,1} (m)	-0.001	0.048	0.128	0.170		U _{i,2} (m)	0.092	0.054	-0.007	-0.045		
Δ _{sys} (m)			0.117			Δ _{sys,1} (m)			0.118			Δ _{sys,2} (m)			0.093			
M _{sys} (tn)		2348.20	(91.5% of particip. mass)			M _{sys,1} (tn)		1914.94	(74.6% of particip. mass)			M _{sys,2} (tn)		650.47	25.3% of particip. mass)			
Δ _{yi} (m)		0.035	0.057			Δ _{yi,1} (m)		0.037	0.057			Δ _{yi,2} (m)		0.036	0.047			
μ _{Δi}		2.09	2.25			μ _{Δi,1}		1.31	2.25			μ _{Δi,2}		1.52	0.15			
ξ _{si} (%)	5.0	13.3	13.8	5.0		ξ _{i,1} (%)	5.0	8.8	13.8	5.0		ξ _{i,2} (%)	5.0	10.5	5.0	5.0		
x(%) = F _{abt} /V _B			31.9			x ₁ (%) = F _{abt,1} /V _{B,1}			24.9			x ₂ (%) = F _{abt,2} /V _{B,2}			14.4			
Q _i = V _i Δ _i	42.63	113.13	167.13	155.23	478.12	Q _{i,1} = V _{i,1} U _{i,1}	0.00	41.52	215.52	145.03	402.08	Q _{i,2} = V _{i,2} U _{i,2}	42.63	93.53	2.28	10.20	148.64	
Q _i / ΣQ _k	0.089	0.237	0.350	0.325	1.000	Q _{i,1} / ΣQ _{k,1}	0.000	0.103	0.536	0.361	1.000	Q _{i,2} / ΣQ _{k,2}	0.287	0.629	0.015	0.069	1.000	
ξ _{sys} (%)			10.1			ξ _{sys,1} (%)			10.1			ξ _{sys,2} (%)			8.4			
T _{eff} (sec)			1.61			T _{eff,1} (sec)			1.62			T _{eff,2} (sec)			1.21			
K _{eff} (kN/m)			35965.8			K _{eff,1} (kN/m)			28876.2			K _{eff,2} (kN/m)			17588.4			
V _B (kN)			4210.2			V _{B,1} (kN)			3398.5			V _{B,2} (kN)			1639.6			
V _i (kN)	462.2	1560.0	1306.0	882.0	4210.2	V _{i,1} (kN)	-4.8	864.0	1686.9	852.5	3398.5	V _{i,2} (kN)	462.2	1722.2	-318.7	-226.1	1639.6	
K _{eff,i} (kN/m)	5011.4	21510.2	10206.2	5011.4		K _{eff,i1} (kN/m)	5011.4	17975.9	13203.0	5011.4		K _{eff,i2} (kN/m)	5011.4	31712.0	44478.6	5011.4		
K _{eff,i} /K _{g,i} (%)		8.12	7.96			K _{eff,i1} /K _{g,i1} (%)		7.60	10.30			K _{eff,i2} /K _{g,i2} (%)		11.68	28.49			
<i>3rd Iteration - EMS.3</i>						<i>3rd Iteration - EMS.3 (Mode 1)</i>						<i>3rd Iteration - EMS.3 (Mode 2)</i>						
δ _i (m)	0.122	0.094	0.165	0.228		u _{i,1} (m)	-0.004	0.060	0.164	0.220		u _{i,2} (m)	0.122	0.072	-0.008	-0.058		
Δ _i (m)	0.094	0.072	0.127	0.176		U _{i,1} (m)	-0.003	0.046	0.127	0.170		U _{i,2} (m)	0.094	0.056	-0.007	-0.045		
Δ _{sys} (m)			0.117			Δ _{sys,1} (m)			0.118			Δ _{sys,2} (m)			0.093			
M _{sys} (tn)		2350.13	(91,6% of particip. mass)			M _{sys,1} (tn)		1886.18	(73,5% of particip. mass)			M _{sys,2} (tn)		679.26	(26,5% of particip. mass)			
μ _{Δi}		2.08	2.24			μ _{Δi,1}		1.26	2.23			μ _{Δi,2}		1.56	0.14			
ξ _{si} (%)	5.0	13.3	13.8	5.0		ξ _{i,1} (%)	5.0	8.3	13.8	5.0		ξ _{i,2} (%)	5.0	10.7	5.0	5.0		
x(%)=F _{abt} /V _B			32.0			x ₁ (%) = F _{abt,1} /V _{B,1}			24.8			x ₂ (%) = F _{abt,2} /V _{B,2}			14.6			
ξ _{sys} (%)			10.0			ξ _{sys,1} (%)			10.0			ξ _{sys,2} (%)			8.6			
T _{eff} (sec)			1.60			T _{eff,1} (sec)			1.61			T _{eff,2} (sec)			1.22			
K _{eff} (kN/m)			36292.3			K _{eff,1} (kN/m)			28619.3			K _{eff,2} (kN/m)			18126.1			
V _B (kN)			4236.6			V _{B,1} (kN)			3368.4			V _{B,2} (kN)			1688.8			
V _i (kN)	472.7	1568.6	1313.3	882.0	4236.6	V _{i,1} (kN)	-17.1	857.9	1675.0	852.6	3368.4	V _{i,2} (kN)	472.4	1769.5	-327.5	-225.6	1688.8	
K _{eff,i} (kN/m)	5011.4	21678.5	10330.0	5011.4		K _{eff,i1} (kN/m)	5011.4	18577.8	13192.9	5011.4		K _{eff,i2} (kN/m)	5011.4	31765.5	50099.1	5011.4		
K _{eff,i} /K _{g,i} (%)		8.19	8.06			K _{eff,i1} /K _{g,i1} (%)		7.85	10.30			K _{eff,i2} /K _{g,i2} (%)		11.70	32.09			
<i>SRSS Combination</i>						<i>Structural Analysis (Mode 1)</i>						<i>Structural Analysis (Mode 2)</i>						
Δ _{ansi} (m)	0.098	0.077	0.129	0.177		K _{eff,i1} /K _{g,i1} (%)		7.85	10.30			K _{eff,i1} /K _{g,i1} (%)		11.70	32.09			
Divergence (%)	3.9	5.8	1.3	0.4		U _{ansi1} (m)	0.001	0.050	0.129	0.171		U _{ansi1} (m)	0.098	0.058	-0.004	-0.043		
						V _{ansi1} (m)	4.6	874.1	1634.3	855.4	3368.4	V _{ansi1} (m)	489.5	1752.7	-335.9	-217.4	1688.9	
						x _{an,1} (%)			25.5			x _{an,1} (%)			16.1			
<i>Convergence Achieved</i>																		

Table A3. Loop 2, Design Iterations 3 & 4, Structural Analyses (0.36g - D=2.0 m).

Member	Abt ₁	Col ₁	Col ₂	Abt ₂	Sum	Member	Abt ₁	Col ₁	Col ₂	Abt ₂	Sum	Member	Abt ₁	Col ₁	Col ₂	Abt ₂	Sum
<i>3rd Iteration - EMS.3</i>						<i>3rd Iteration - EMS.3 (Mode 1)</i>						<i>3rd Iteration - EMS.3 (Mode 2)</i>					
h _{eq,i} (m)		4.18	5.45			h _{eq,i1} (m)		6.80	5.45			h _{eq,i2} (m)		4.15	5.69		
x _{k,i} (%)		61.2	60.6			x _{k,i1} (%)		97.1	60.6			x _{k,i2} (%)		59.2	71.8		
x _{Δy,i} (%)		51.8	61.8			x _{Δy,i1} (%)		97.2	61.7			x _{Δy,i2} (%)		60.7	72.7		
K _{g,i} (kN/m)		616252.5	275517.7			K _{g,i1} (kN/m)		226954.3	275689.3			K _{g,i2} (kN/m)		611140.0	286235.8		
K _{eff,i} /K _{g,i} (%)		7.74	10.89			K _{eff,i1} /K _{g,i1} (%)		9.0	13.5			K _{eff,i2} /K _{g,i2} (%)		9.0	102.3		
δ _i (m)	0.181	0.113	0.165	0.249		u _{i,1} (m)	-0.036	0.040	0.165	0.241		u _{i,2} (m)	0.177	0.106	0.003	-0.063	
Δ _D (m)	0.176	0.218	0.278	0.176		U _{i,1} (m)	-0.025	0.028	0.117	0.170		U _{i,2} (m)	0.125	0.075	0.002	-0.044	
Δ _i (m)	0.128	0.080	0.117	0.176		Δ _{sys,1} (m)			0.119			Δ _{sys,2} (m)			0.101		
Δ _{sys} (m)			0.116			M _{sys,1} (tn)		1589.32	(61.6% of particip. mass)			M _{sys,2} (tn)		992.59	38.4% of particip. mass)		
M _{sys} (tn)		2413.65	(93.5% of particip. mass)			Δ _{y,i1} (m)		0.048	0.050			Δ _{y,i2} (m)		0.030	0.046		
Δ _{yi} (m)		0.036	0.050			μ _{Δi,1}		0.58	2.35			μ _{Δi,2}		2.47	0.04		
μ _{Δi}		2.22	2.35			ξ _{i1} (%)	5.0	5.0	14.1	5.0		ξ _{i,2} (%)	5.0	14.5	5.0	5.0	
ξ _{si} (%)	5.0	13.7	14.1	5.0		x _i (%) = F _{abt,1} /V _{B,1}			12.9			x ₂ (%) = F _{abt,2} /V _{B,2}			10.1		
x (%) = F _{abt} /V _B			17.3			Q _{i,1} = V _{i,1} U _{i,1}	3.20	16.38	503.94	145.42	668.94	Q _{i,2} = V _{i,2} U _{i,2}	78.57	302.97	-0.87	9.81	390.48
Q _i / ΣQ _k	0.086	0.318	0.432	0.164	1.000	Q _{i,1} / ΣQ _{k,1}	0.005	0.024	0.753	0.217	1.000	Q _{i,2} / ΣQ _{k,2}	0.201	0.776	-0.002	0.025	1.000
ξ _{sys} (%)			11.7			ξ _{sys,1} (%)			11.9			ξ _{sys,2} (%)			12.4		
T _{eff} (sec)			1.12			T _{eff,1} (sec)			1.15			T _{eff,2} (sec)			0.99		
K _{eff} (kN/m)			75737.4			K _{eff,1} (kN/m)			47253.3			K _{eff,2} (kN/m)			39652.2		
V _B (kN)			8813.0			V _{B,1} (kN)			5622.8			V _{B,2} (kN)			4015.2		
V _i (kN)	640.1	3778.8	3512.0	882.0	8813.0	V _{i,1} (kN)	-126.7	580.6	4315.2	853.7	5622.8	V _{i,2} (kN)	627.5	4062.8	-453.4	-221.8	4015.2
K _{eff,i} (kN/m)	5011.4	47398.7	30068.8	5011.4		K _{eff,i1} (kN/m)	5011.4	20588.8	36950.3	5011.4		K _{eff,i2} (kN/m)	5011.4	54483.8	236445.6	5011.4	
K _{eff,i} /K _{g,i} (%)		7.69	10.91			K _{eff,i1} /K _{g,i1} (%)		9.07	13.40			K _{eff,i2} /K _{g,i2} (%)		8.92	82.61		
<i>4th Iteration - EMS.4</i>						<i>4th Iteration - EMS.4 (Mode 1)</i>						<i>4th Iteration - EMS.4 (Mode 2)</i>					
δ _i (m)	0.181	0.113	0.166	0.249		u _{i,1} (m)	-0.035	0.040	0.166	0.241		u _{i,2} (m)	0.177	0.105	0.002	-0.063	
Δ _i (m)	0.127	0.080	0.117	0.176		U _{i,1} (m)	-0.025	0.028	0.117	0.170		U _{i,2} (m)	0.125	0.074	0.002	-0.044	
Δ _{sys} (m)			0.116			Δ _{sys,1} (m)			0.119			Δ _{sys,2} (m)			0.101		
M _{sys} (tn)		2413.52	(93.5% of particip. mass)			M _{sys,1} (tn)		1594.48	(61.8% of particip. mass)			M _{sys,2} (tn)		987.44	(38.2% of particip. mass)		
μ _{Δi}		2.22	2.35			μ _{Δi,1}		0.59	2.35			μ _{Δi,2}		2.47	0.04		
ξ _{si} (%)	5.0	13.7	14.1	5.0		ξ _{i1} (%)	5.0	5.0	14.1	5.0		ξ _{i,2} (%)	5.0	14.5	5.0	5.0	
x (%) = F _{abt} /V _B			17.3			x _i (%) = F _{abt,1} /V _{B,1}			12.9			x ₂ (%) = F _{abt,2} /V _{B,2}			10.1		
ξ _{sys} (%)			11.7			ξ _{sys,1} (%)			11.9			ξ _{sys,2} (%)			12.3		
T _{eff} (sec)			1.12			T _{eff,1} (sec)			1.15			T _{eff,2} (sec)			0.99		
K _{eff} (kN/m)			75749.1			K _{eff,1} (kN/m)			47482.5			K _{eff,2} (kN/m)			39431.9		
V _B (kN)			8812.8			V _{B,1} (kN)			5643.9			V _{B,2} (kN)			3996.0		
V _i (kN)	638.7	3779.5	3512.6	882.0	8812.8	V _{i,1} (kN)	-124.9	583.0	4332.3	853.5	5643.9	V _{i,2} (kN)	626.4	4043.4	-451.2	-222.6	3996.0
K _{eff,i} (kN/m)	5011.4	47446.0	30058.4	5011.4		K _{eff,i1} (kN/m)	5011.4	20490.8	37077.5	5011.4		K _{eff,i2} (kN/m)	5011.4	54342.5	257601.4	5011.4	
K _{eff,i} /K _{g,i} (%)		7.70	10.91			K _{eff,i1} /K _{g,i1} (%)		9.03	13.45			K _{eff,i2} /K _{g,i2} (%)		8.89	90.00		
<i>SRSS Combination</i>						<i>Structural Analysis (Mode 1)</i>						<i>Structural Analysis (Mode 2)</i>					
Δ _{ans,i} (m)	0.137	0.085	0.126	0.191		K _{eff,i1} /K _{g,i1} (%)		9.03	13.45			K _{eff,i1} /K _{g,i1} (%)		8.89	90.00		
Divergence (%)	7.8	6.5	7.9	8.7		U _{ans,i1} (m)	-0.028	0.030	0.126	0.185		U _{ans,i1} (m)	0.134	0.079	0.002	-0.047	
						V _{ans,i1} (m)	-142.1	723.7	4137.6	924.6	5643.9	V _{ans,i1} (m)	670.5	4045.9	-484.8	-235.6	3996.0
						x _{ans,i1} (%)			13.9			x _{ans,i1} (%)			10.9		
<i>Convergence Achieved</i>																	