


# ANALYSIS OF TOP ANCHORED HARD CONNECTED PIPE RISER (DISTRIBUTED HYD LOAD CARRIED UP RISER)

SUITABLE FOR EXPANSIVE SYSTEMS, DO NOT USE ON CONTRACTIVE SYSTEMS

		KINETICS NOISE CONTROL, INC. 6300 IRELAN PLACE DUBLIN, OHIO 43017 614-889-0480																
Project: <b>TOP ANCHORED HARD CONNECTED (TYPE 2)</b>		3/12/2006																
Riser: <b>TYPICAL RISER</b>																		
Note: Supports are assumed to be at floor level, if at ceiling level, identify as being on floor above																		
Expansion Coef <b>7.60E-05</b> in/ft/degF		Indicate Support locations with a "Y" and guide locations with a "G" in the Support Location Column. Restrained Spring Isolators such as FRS are indicated with an "R" under "Support/Res" + Force loads are Tension, - Force loads are Compression (in pipe) ". " indicates no supports above this point																
Installed Temp <b>70</b>																		
Oper Temp <b>91</b>																		
Anchor Elevation <b>72</b> (If Anchored System)																		
Anchor Type <b>FX</b> (Fixed-FX or Floating FL)																		
Static Head <b>0</b> (Ft at top of pipe)																		
Water Supported <b>Y</b> (Y or N) Is water column weight supported by Riser?																		
Hyd Lift @ Top <b>Y</b> If an Intermediate Riser section with telescoping Coupling at top, Enter "N" otherwise enter "Y"																		
Liq or Gas Piping <b>L</b> (L or G) Is the pipe filled with water or gas?																		
Steam Pressure <b>0</b> (Enter a value only if steam pressure is present (psi))																		
Floor (Ref)	Support Loc	Res	Floor Ht Ft	Floor Elev Ft	Pipe Size in	Local Pipe Wt (lb)	Local Liquid Wt (lb)	Init Support Pt Load From Pipe Wt (Lb)	Hyd Thrust Pipe Lift is + (lb)	Spring Rate Lb/in	Init Defl In	Supt Pt Force Lbs	Oper Sprng Defl or Disp + is Down in	Oper Supt Pt Load Lbs	Init Tens Pipe Force Lbs	Oper Tens Pipe Force Lbs	Initial Pipe Stress PSI	Combined Burst + Tens Oper Stress PSI
Roof				82.01				0	0			0		0	0	0		
10	-			82.01				0	217			0	-0.02	0	0	0		
9	A		10.00	72.01	8			0	0			0		0	-286	-69	34	47
8			10.00	62.01	8			286	0			571	0.02	946	0	592	0	117
7	Y	R	10.00	52.01	8			571	0	1000	0.88	571	0.91	912	286	1218	34	201
6			10.00	42.01	8			0	0			0		0	0	933	0	217
5	Y	R	10.00	32.01	8			690	621	1000	0.88	690	0.94	944	405	2212	48	351
4			10.00	22.01	10			0	0			0		0	0	1807	0	388
3	Y	R	10.00	12.01	10			810	0	1000	0.85	810	0.95	946	405	2348	34	460
2			10.00	2.01	10			0	0			0		0	0	1943	0	503
1	Y	R	2.00	0.01	10			81	0	1000	0.82	81	0.93	935	0	2797	0	541
0			0.01	0	10			0	-2797			0	0.11	0	0	0	0	487

Critical Buckling Load for piping -23254 lb

## SAMPLE 8 STORY RISER WITH ANCHOR AT TOP AND VERTICALLY RESTRAINED ISOLATORS

NOTE THAT THERE IS NO LARGE CONCENTRATED FORCE AT THE ANCHOR ELEVATION IN SERVICE, AND THAT THE ANCHOR (AT THE TOP) IS PROTECTED FROM A SIGNIFICANT UPLIFTING FORCE DURING INSTALLATION BY THE RESTRAINED COILS BELOW.

IN SERVICE HYDRAULIC LOADS ARE CARRIED UP THE RISER TO MULTIPLE ISOLATORS AT THE EXPENSE OF HIGHER TENSILE LOADS AND STRESSES IN THE PIPE ITSELF.

### ANALYSIS OF TYPE 2 TOP ANCHORED HARD CONNECTED RISER

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KINETICS™ Riser Design Manual