		INITIAL CASE		ADDITIONAL CASES									
		Cantilever Deflection											
Element in model "CANTILEVER_10 CASES.C2"				10-20	110-120	210-220	310-320	410-420	510-520	610-620	710-720	810-820	910-920
	Do	8.625	in	8.625	8.625	8.625	8.625	8.625	8.625	8.625	8.625	8.625	8.625
	t	0.322	in	0.322	0.322	0.322	0.322	0.322	0.322	0.322	0.322	0.322	0.322
	Di	7.981		7.981	7.981	7.981	7.981	7.981	7.981	7.981	7.981	7.981	7.981
Length is only parameter varying between cases	L	120	in	120	108	96	84	72	60	48	36	24	12
	E	2.95E+07	psi	2.95E+07	2.95E+07	2.95E+07	2.95E+07	2.95E+07	2.95E+07	2.95E+07	2.95E+07	2.95E+07	2.95E+07
	P	-1000	lb	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000
	I	72.48924	in^4	72.48924	72.48924	72.48924	72.48924	72.48924	72.48924	72.48924	72.48924	72.48924	72.48924
	delta = PL^3/3EI												
	delta =	**-0.2694**	**in**	**-0.2694**	**-0.1964**	**-0.1379**	**-0.0924**	**-0.0582**	**-0.0337**	**-0.0172**	**-0.0073**	**-0.0022**	**-0.0003**
Deflection at end node (see "Displacements" Tab)	**CAESAR II**	**-0.2719**	**in**	**-0.2719**	**-0.1986**	**-0.1399**	**-0.0941**	**-0.0597**	**-0.0349**	**-0.0182**	**-0.008**	**-0.0027**	**-0.0005**
	% error	0.93%		0.94%	1.14%	1.44%	1.85%	2.61%	3.65%	5.58%	10.00%	25.30%	85.63%
Poisson's Ratio	v	0.292		0.292	0.292	0.292	0.292	0.292	0.292	0.292	0.292	0.292	0.292
Shear Modulus	G	11416409	psi	11416409	11416409	11416409	11416409	11416409	11416409	11416409	11416409	11416409	11416409
Pipe X-Section Area	A	8.399255	in^2	8.399255	8.399255	8.399255	8.399255	8.399255	8.399255	8.399255	8.399255	8.399255	8.399255
Shear Coefficient (Note 1)	alpha_s	2		2	2	2	2	2	2	2	2	2	2
Bending Deflection (Note 2)	v_b	**-0.2694**	in	**-0.2694**	**-0.1964**	**-0.1379**	**-0.0924**	**-0.0582**	**-0.0337**	**-0.0172**	**-0.0073**	**-0.0022**	**-0.0003**
Shear Deflection (Note 3)	v_s	**-0.0025**	in	**-0.0025**	**-0.0023**	**-0.0020**	**-0.0018**	**-0.0015**	**-0.0013**	**-0.0010**	**-0.0008**	**-0.0005**	**-0.0003**
Total Deflection	v_t	**-0.2719**	in	**-0.2719**	**-0.1986**	**-0.1399**	**-0.0941**	**-0.0597**	**-0.0349**	**-0.0182**	**-0.0080**	**-0.0027**	**-0.0005**
Error between Caesar II result & Total Deflection	% error	0.02%		0.02%	0.01%	0.01%	0.04%	0.03%	0.06%	0.22%	0.29%	1.68%	3.78%

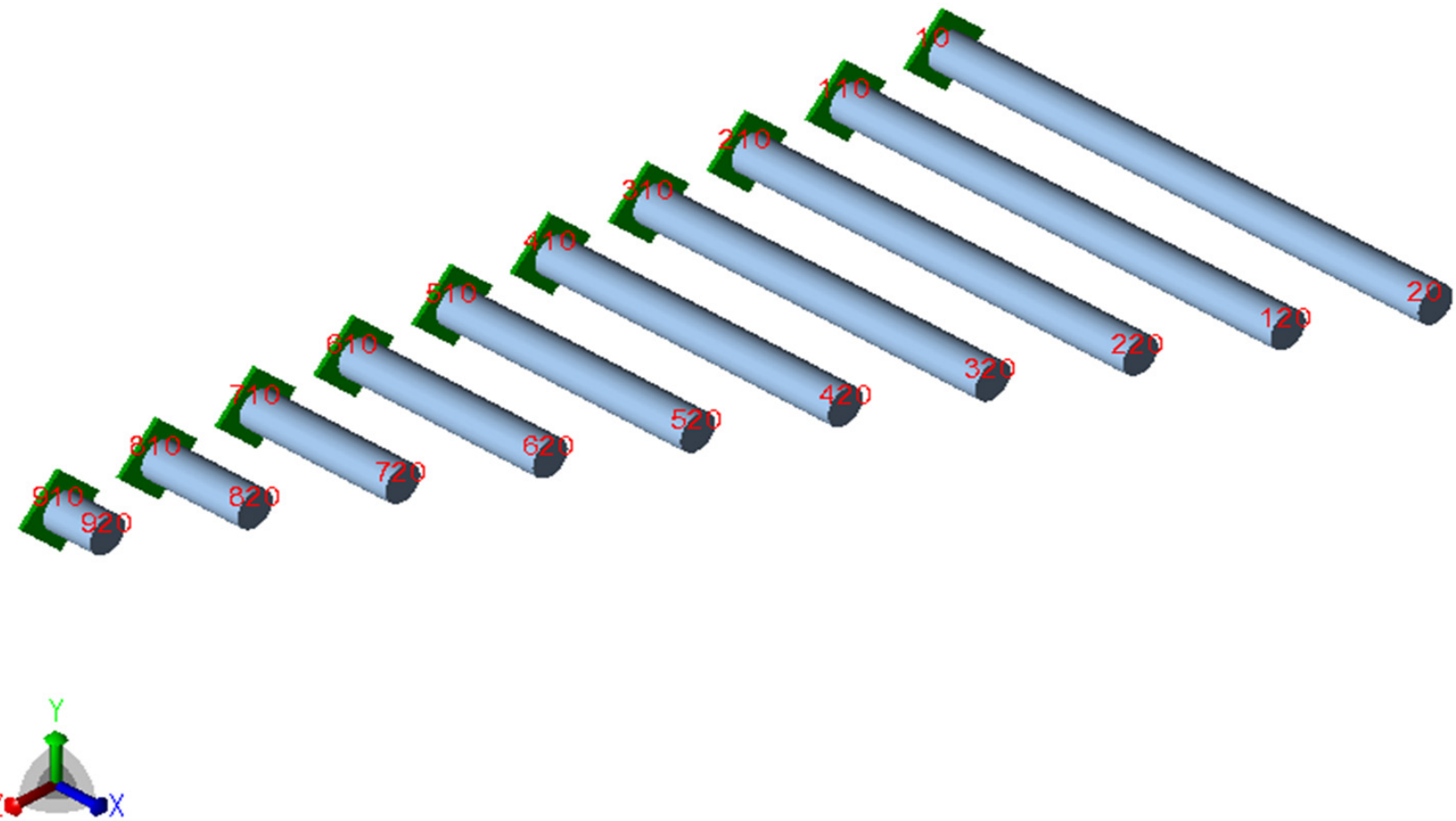
Notes:

1. Value of 2 is from Table 11-4 of "Mechanics of Materials" - Timoshenko & Gere, 1972. Results are closer using equation from "The Shear Coefficient in Timoshenko's Beam Theory" Cowper, 1966 which gives a value of 1.882.
2. v_b = P*L^3/(3*E*I). This matches the calc from above.
3. v_s = alpha_s*P*L/(G*A). Equation labelled (j) on page 206 of "Mechanics of Materials" - Timoshenko & Gere, 1972.
4. Highlighted yellow text is from Richard Ay's spreadsheet in cantilever.zip, posted 06/22/11 01:17 PM. http://65.57.255.42/ubbthreads/ubbthreads.php?ubb=showflat&Number=43414 (retrieved 08/17/2011)

CAESAR II 2011 Ver.5.30.0, (Build 101122) Date: AUG 17, 2011 Time: 12:51
Job: H:\STRESS\CANTILEVER_10 CASES

DISPLACEMENTS REPORT: Nodal Movements
CASE 1 (SUS) F1

NODE	DX in.	DY in.	DZ in.	RX deg.	RY deg.	RZ deg.
10	0	0	0	0	0	0
20	0	-0.2719	0	0	0	-0.1929
110	0	0	0	0	0	0
120	0	-0.1986	0	0	0	-0.1563
210	0	0	0	0	0	0
220	0	-0.1399	0	0	0	-0.1235
310	0	0	0	0	0	0
320	0	-0.0941	0	0	0	-0.0945
410	0	0	0	0	0	0
420	0	-0.0597	0	0	0	-0.0694
510	0	0	0	0	0	0
520	0	-0.0349	0	0	0	-0.0482
610	0	0	0	0	0	0
620	0	-0.0182	0	0	0	-0.0309
710	0	0	0	0	0	0
720	0	-0.008	0	0	0	-0.0174
810	0	0	0	0	0	0
820	0	-0.0027	0	0	0	-0.0077
910	0	0	0	0	0	0
920	0	-0.0005	0	0	0	-0.0019


10
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Y
Z
X