



# INPUT BS GEOMETRY:

## Geometrical Properties:

- Stiff straight section length	700	mm
- Conical Length	4600	mm
- Tip straight section length	0	mm
- Root OD	930	mm
- Tip OD	199	mm
- ID	142	mm

## Material Data (for linear calculations only):

- E-modulus	200.700	MPa
- Limiting strain	10%	

## Umbilical Data:

- Umbilical OD	133.0	mm
- Umbilical EI	12.6	kNm <sup>2</sup>
- MBR	9	m
(curvature)	0.11111	
- Riser length (in model)	0.5	m

## BS Volume

- Straight section	464.4	liter
- Conical section	1239.3	liter
- Tip section	0.0	liter
	1703.7	liter

## PU mass:

- PU density	1130	kg/m <sup>3</sup>
- Mass	1925.2	kg



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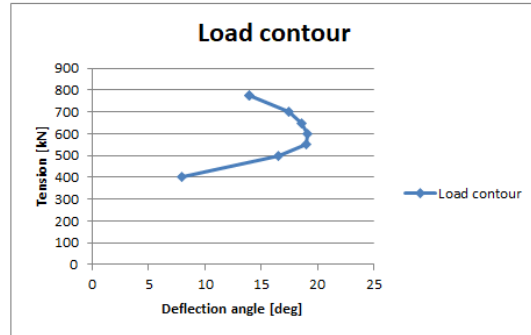
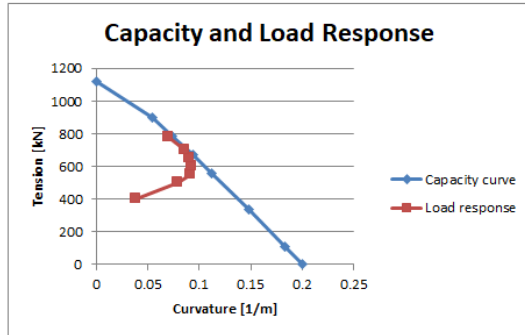
E-modulus for the material is:

- Cold condition: E = 200.7 MPa
- Warm condition: E = 162.3 MPa

### Umbilical Capacity Curve: Load Contour:

Curvature [1/m]	Tension [kN]
0.200676	0
0.183399	112
0.14821	336
0.111932	560
0.093432	672
0.074076	784
0.054919	896
0	1117.43

Load Case [-]	Angle [deg]	Tension [kN]	Max. Curv. @ Tension
1	8	400	0.13784
2	16.5	500	0.12165
3	19	550	0.11355
4	19.1	600	0.10532
5	18.6	650	0.09707
6	17.5	700	0.08859
7	14	775	0.07563
8	14	775	0.07563



Load Case:	1	2	3	4	5	6	7	8	
Angle:	8	16.5	19	19.1	18.6	17.5	14	14	deg.
Tension:	400	500	550	600	650	700	775	775	kN
Cone root bending moment:	130.00	311.41	381.96	407.27	418.73	414.33	355.43	355.43	kNm
BS flange bending moment:	168.97	410.81	507.31	544.70	563.86	561.67	486.68	486.68	kNm
Shear force at BS flange:	-55.67	-142.01	-179.06	-196.33	-207.32	-210.49	-187.49	-187.49	kN
Tension at BS flange:	396.11	479.41	520.04	566.97	616.05	667.60	751.98	751.98	kN
Max. curvature:	0.03815	0.07879	0.09124	0.09242	0.09086	0.08645	0.07051	0.07051	m <sup>-1</sup>
MBR:	26.21	12.69	10.96	10.82	11.01	11.57	14.18	14.18	m
Location of max. curvature (ref. flange):	3.58	3.23	3.07	2.91	2.77	2.63	2.43	2.43	m
Allowable curvature @ Tension:	0.13784	0.12165	0.11355	0.10532	0.09707	0.08859	0.07563	0.07563	m <sup>-1</sup>
Margin:	0.09969	0.04286	0.02232	0.01291	0.00620	0.00214	0.00513	0.00513	m <sup>-1</sup>
Margin [%]:	72%	35%	20%	12%	6%	2%	7%	7%	