

Impact Severity = 0.5 \* m \* (v \* sin θ)^2

Impact Severity = 0.5 \* vehicle weight/gravity \* (impact speed \* sin (impact angle))^2

TL-3      2270P pickup truck vehicle mass (lbs/g) =      5000 / 32.2 =      155.28  
 impact speed (ft/s = m/h\*1.46) =      62 \* 1.46 =      90.52  
 θ = sin θ = SIN(RADIANS(θ)) =      25 =      0.42  
 Impact Severity (lbs-ft) =      113623.91  
 Impact Severity (kip-ft) =      113.62

MwRSF Values ->

TL-2      2270P pickup truck vehicle mass (lbs/g) =      5000 / 32.2 =      155.28  
 impact speed (ft/s = m/h\*1.46) =      44 \* 1.46 =      64.24  
 θ = sin θ = SIN(RADIANS(θ)) =      25 =      0.42  
 Impact Severity (lbs-ft) =      57225.78  
 Impact Severity (kip-ft) =      57.23  
 Percent of TL-3 =      50%

TL-1      2270P pickup truck vehicle mass (lbs/g) =      5000 / 32.2 =      155.28  
 impact speed (ft/s = m/h\*1.46) =      33 \* 1.46 =      48.18  
 θ = sin θ = SIN(RADIANS(θ)) =      25 =      0.42  
 Impact Severity (lbs-ft) =      32189.50  
 Impact Severity (kip-ft) =      32.19  
 Percent of TL-3 =      28%

Speed (mph)	Impact Severity (kip-ft)	Percent of TL-3	Option 1 - Change Anchor Length, Keep Deflection at 45.3"				Option 2 - Keep Anchor Length at 200', Change Deflection	
			TBR anchor length (ft)	TBR anchor sections	Minimum sections not including Work Area	Minimum length not including Work Area	Calculated Deflection (in)	Designed Deflection (in)
75	166	146%	146.33	12	24	300	66.3	66
70	145	127%	127.47	11	22	275	57.7	60
65	125	110%	109.91	9	18	225	49.8	48
62	114	100%	100.00	8	16	200	45.3	48
60	106	94%	93.65	8	16	200	42.4	42
55	89	79%	78.69	7	14	175	35.6	36
50	74	65%	65.04	6	12	150	29.5	30
45	60	53%	52.68	5	10	125	23.9	24
40	47	42%	41.62	4	8	100	18.9	18
35	36	32%	31.87	3	6	75	14.4	12
30	27	23%	23.41	2	4	50	10.6	12
25	18	16%	16.26	2	4	50	7.4	12

TBR "anchor" sections for 62 mph = 8 from page 6 of MwRSF Report TRP-03-209-09

<http://mwrsf.unl.edu/researchhub/files/Report63/TRP-03-209-09.pdf>

Calculated deflection for 62 mph = 45.3 inches from page 14 of MwRSF Report TRP-03-113-03

[http://mwrsf.unl.edu/researchhub/files/Report243/TRP-03-113-03%20\(revised\).pdf](http://mwrsf.unl.edu/researchhub/files/Report243/TRP-03-113-03%20(revised).pdf)