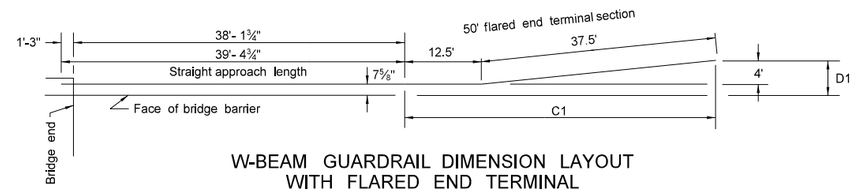
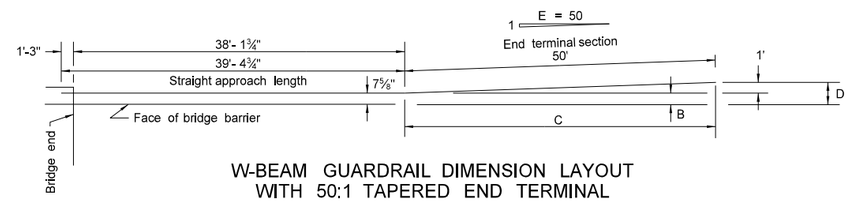
LENGTH OF NEED TABLE 30 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	CLEAR ROADWAY WIDTH OF BRIDGE	STRAIGHT APPROACH LENGTH (2)	APPROACH SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)	OPPOSITE SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)
		FT	FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT		FT
UNDER 750 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
750 - 1500 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
1500 - 2000 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
2000 - 6000 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
OVER 6000 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	37.36	3.75	49.75	8.72			10	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4

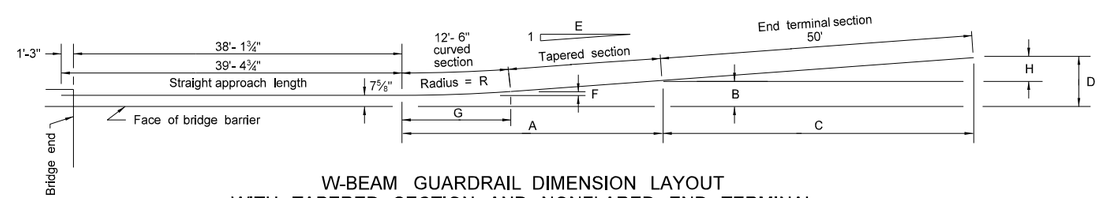
GUARDRAIL AT BRIDGE ENDS
30 MPH DESIGN SPEED



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH FLARED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH 50:1 TAPERED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH TAPERED SECTION AND NONFLARED END TERMINAL

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
30	0.62	12.48	4.98	125.42

NOTES:

On divided highways use distance from roadway centerline to bridge rail x 2 and use this as clear roadway width of the bridge to determine guardrail length.

The contractor shall use wood posts for W-beam guardrail.

(1) Does not include end terminal section

(2) The 39.4' straight approach length is for use with the transition shown on Standard Drawing D-764-3.

For the transition shown on Standard Drawing D-764-3A, revise straight approach length to 45.65'.

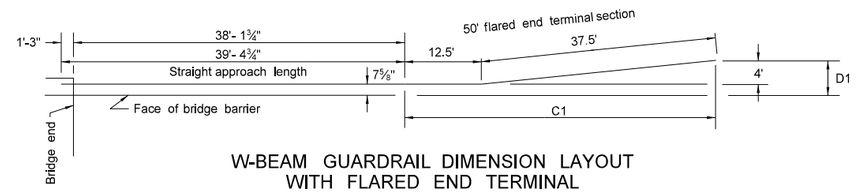
(3) Dimensions "B", "D" and "D1" include the 7⅝" (0.64') offset from the lower face of jersey barrier to the rear face of the W-beam guardrail.

For installations using the transition shown on Standard Drawing D-764-3A, subtract 0.64' from the dimensions "B", "D" and "D1", to obtain offset from face of guardrail connection plate.

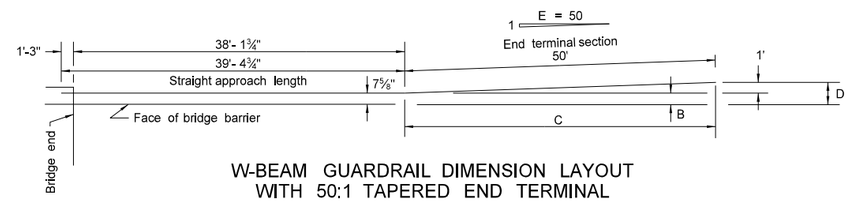
LENGTH OF NEED TABLE 40 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	CLEAR ROADWAY WIDTH OF BRIDGE	STRAIGHT APPROACH LENGTH (2)	APPROACH SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)	OPPOSITE SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)
		FT	FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT		FT
UNDER 750 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
750 - 1500 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
1500 - 2000 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
2000 - 6000 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	37.36	3.75	49.75	8.72			10	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
OVER 6000 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	37.36	3.75	49.75	8.72			10	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	37.36	3.75	49.75	8.72			10	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	49.79	4.99	49.75	9.96			10	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4

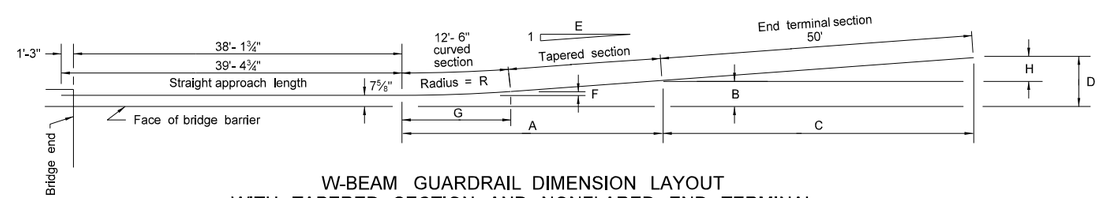
GUARDRAIL AT BRIDGE ENDS
40 MPH DESIGN SPEED



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH FLARED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH 50:1 TAPERED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH TAPERED SECTION AND NONFLARED END TERMINAL

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
40	0.62	12.48	4.98	125.42

NOTES:

On divided highways use distance from roadway centerline to bridge rail x 2 and use this as clear roadway width of the bridge to determine guardrail length.

The contractor shall use wood posts for W-beam guardrail.

(1) Does not include end terminal section

(2) The 39.4' straight approach length is for use with the transition shown on Standard Drawing D-764-3.

For the transition shown on Standard Drawing D-764-3A, revise straight approach length to 45.65'.

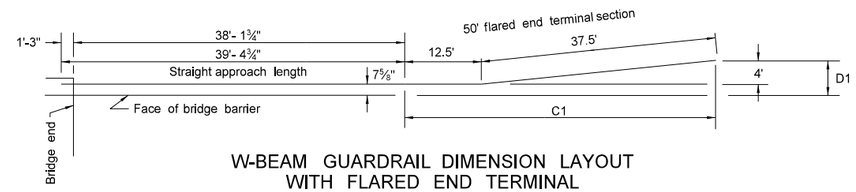
(3) Dimensions "B", "D" and "D1" include the 7⅝" (0.64') offset from the lower face of jersey barrier to the rear face of the W-beam guardrail.

For installations using the transition shown on Standard Drawing D-764-3A, subtract 0.64' from the dimensions "B", "D" and "D1", to obtain offset from face of guardrail connection plate.

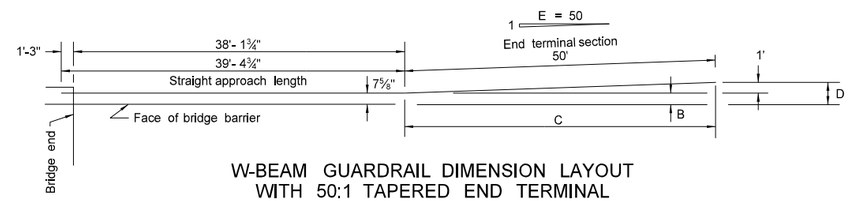
LENGTH OF NEED TABLE 45 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	CLEAR ROADWAY WIDTH OF BRIDGE	STRAIGHT APPROACH LENGTH (2)	APPROACH SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)	OPPOSITE SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)
		FT	FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT		FT
UNDER 750 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
750 - 1500 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	37.36	3.75	49.75	8.72			10	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	37.36	3.75	49.75	8.72			10	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	49.79	4.99	49.75	9.96			10	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
1500 - 2000 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	37.36	3.75	49.75	8.72			10	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	37.36	3.75	49.75	8.72			10	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	49.79	4.99	49.75	9.96			10	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	49.79	4.99	49.75	9.96			10	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
2000 - 6000 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	37.36	3.75	49.75	8.72			10	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	37.36	3.75	49.75	8.72			10	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	49.79	4.99	49.75	9.96			10	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	49.79	4.99	49.75	9.96			10	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	62.23	6.23	49.75	11.21			10	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
OVER 6000 ADT	48	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	12.48	1.26	49.75	6.23			10	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	24.92	2.50	49.75	7.48			10	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	37.36	3.75	49.75	8.72			10	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	37.36	3.75	49.75	8.72			10	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	37.36	3.75	49.75	8.72			10	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	49.79	4.99	49.75	9.96			10	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	49.79	4.99	49.75	9.96			10	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	62.23	6.23	49.75	11.21			10	101.9	12.48	1.26	49.75	6.23			10	51.9
	26	39.4	62.23	6.23	49.75	11.21			10	101.9	12.48	1.26	49.75	6.23			10	51.9
	24	39.4	74.67	7.48	49.75	12.45			10	114.4	12.48	1.26	49.75	6.23			10	51.9

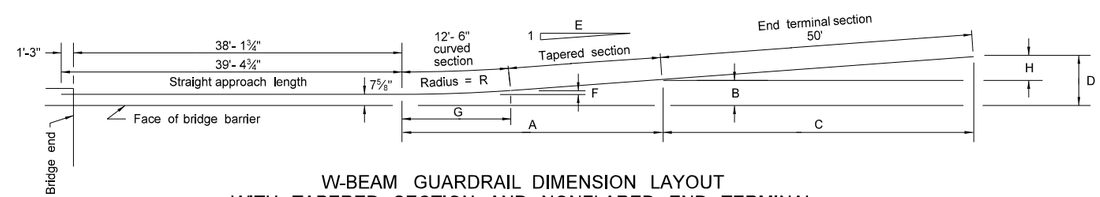
GUARDRAIL AT BRIDGE ENDS
45 MPH DESIGN SPEED



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH FLARED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH 50:1 TAPERED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH TAPERED SECTION AND NONFLARED END TERMINAL

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
45	0.62	12.48	4.98	125.42

NOTES:

On divided highways use distance from roadway centerline to bridge rail x 2 and use this as clear roadway width of the bridge to determine guardrail length.

The contractor shall use wood posts for W-beam guardrail.

(1) Does not include end terminal section

(2) The 39.4' straight approach length is for use with the transition shown on Standard Drawing D-764-3.

For the transition shown on Standard Drawing D-764-3A, revise straight approach length to 45.65'.

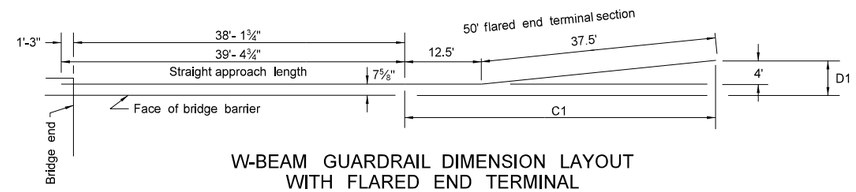
(3) Dimensions "B", "D" and "D1" include the 7⅝" (0.64') offset from the lower face of jersey barrier to the rear face of the W-beam guardrail.

For installations using the transition shown on Standard Drawing D-764-3A, subtract 0.64' from the dimensions "B", "D" and "D1", to obtain offset from face of guardrail connection plate.

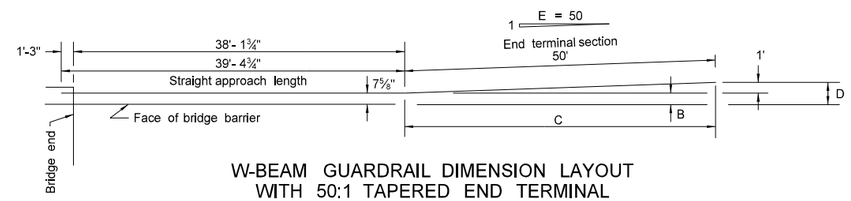
LENGTH OF NEED TABLE 50 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	CLEAR ROADWAY WIDTH OF BRIDGE	STRAIGHT APPROACH LENGTH (2)	APPROACH SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)	OPPOSITE SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)
		FT	FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT		FT
UNDER 750 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	24.93	2.33	49.79	6.86			11	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	24.93	2.33	49.79	6.86			11	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	37.38	3.46	49.79	7.99			11	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	37.38	3.46	49.79	7.99			11	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
750 - 1500 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	24.93	2.33	49.79	6.86			11	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	37.38	3.46	49.79	7.99			11	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	37.38	3.46	49.79	7.99			11	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	49.83	4.60	49.79	9.12			11	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	49.83	4.60	49.79	9.12			11	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	62.27	5.73	49.79	10.26			11	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
1500 - 2000 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	24.93	2.33	49.79	6.86			11	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	24.93	2.33	49.79	6.86			11	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	37.38	3.46	49.79	7.99			11	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	37.38	3.46	49.79	7.99			11	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	49.83	4.60	49.79	9.12			11	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	49.83	4.60	49.79	9.12			11	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	62.27	5.73	49.79	10.26			11	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	62.27	5.73	49.79	10.26			11	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
2000 - 6000 ADT	48	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	24.93	2.33	49.79	6.86			11	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	24.93	2.33	49.79	6.86			11	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	37.38	3.46	49.79	7.99			11	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	37.38	3.46	49.79	7.99			11	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	49.83	4.60	49.79	9.12			11	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	49.83	4.60	49.79	9.12			11	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	62.27	5.73	49.79	10.26			11	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	62.27	5.73	49.79	10.26			11	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	74.72	6.86	49.79	11.39			11	114.4	12.48	1.20	49.79	5.73			11	51.9
OVER 6000 ADT	48	39.4	12.48	1.20	49.79	5.73			11	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	24.93	2.33	49.79	6.86			11	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	24.93	2.33	49.79	6.86			11	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	37.38	3.46	49.79	7.99			11	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	37.38	3.46	49.79	7.99			11	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	49.83	4.60	49.79	9.12			11	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	49.83	4.60	49.79	9.12			11	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	62.27	5.73	49.79	10.26			11	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	62.27	5.73	49.79	10.26			11	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	74.72	6.86	49.79	11.39			11	114.4	12.48	1.20	49.79	5.73			11	51.9
	28	39.4	74.72	6.86	49.79	11.39			11	114.4	12.48	1.20	49.79	5.73			11	51.9
	26	39.4	87.17	7.99	49.79	12.52			11	126.9	12.48	1.20	49.79	5.73			11	51.9
	24	39.4	87.17	7.99	49.79	12.52			11	126.9	12.48	1.20	49.79	5.73			11	51.9

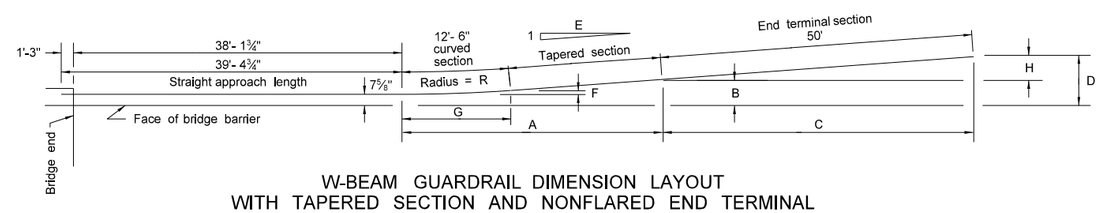
GUARDRAIL AT BRIDGE ENDS
50 MPH DESIGN SPEED



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH FLARED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH 50:1 TAPERED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH TAPERED SECTION AND NONFLARED END TERMINAL

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
50	0.57	12.48	4.53	137.88

NOTES:

On divided highways use distance from roadway centerline to bridge rail x 2 and use this as clear roadway width of the bridge to determine guardrail length.

The contractor shall use wood posts for W-beam guardrail.

(1) Does not include end terminal section

(2) The 39.4' straight approach length is for use with the transition shown on Standard Drawing D-764-3.

For the transition shown on Standard Drawing D-764-3A, revise straight approach length to 45.65'.

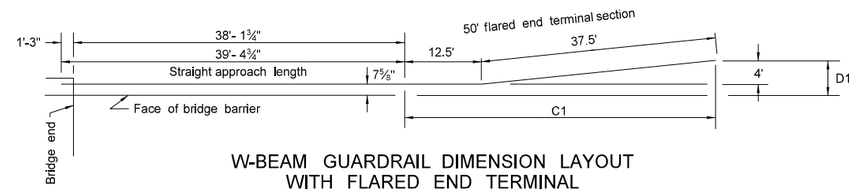
(3) Dimensions "B", "D" and "D1" include the 7⅝" (0.64') offset from the lower face of jersey barrier to the rear face of the W-beam guardrail.

For installations using the transition shown on Standard Drawing D-764-3A, subtract 0.64' from the dimensions "B", "D" and "D1", to obtain offset from face of guardrail connection plate.

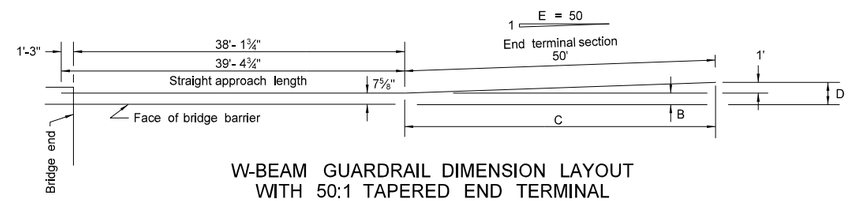
LENGTH OF NEED TABLE 55 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	CLEAR ROADWAY WIDTH OF BRIDGE	STRAIGHT APPROACH LENGTH (2)	APPROACH SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)	OPPOSITE SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)
		FT	FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT		FT
UNDER 750 ADT	48	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	12.49	1.15	49.83	5.31			12	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	12.49	1.15	49.83	5.31			12	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	12.49	1.15	49.83	5.31			12	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	24.95	2.19	49.83	6.35			12	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	24.95	2.19	49.83	6.35			12	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	37.40	3.23	49.83	7.38			12	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	49.86	4.27	49.83	8.42			12	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	49.86	4.27	49.83	8.42			12	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	62.32	5.31	49.83	9.46			12	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
750 - 1500 ADT	48	39.4	12.49	1.15	49.83	5.31			12	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	12.49	1.15	49.83	5.31			12	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	12.49	1.15	49.83	5.31			12	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	12.49	1.15	49.83	5.31			12	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	24.95	2.19	49.83	6.35			12	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	24.95	2.19	49.83	6.35			12	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	37.40	3.23	49.83	7.38			12	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	49.86	4.27	49.83	8.42			12	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	49.86	4.27	49.83	8.42			12	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	62.32	5.31	49.83	9.46			12	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	62.32	5.31	49.83	9.46			12	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	74.77	6.35	49.83	10.50			12	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	74.77	6.35	49.83	10.50			12	114.4	12.49	1.15	49.83	5.31			12	51.9
1500 - 2000 ADT	48	39.4	12.49	1.15	49.83	5.31			12	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	24.95	2.19	49.83	6.35			12	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	24.95	2.19	49.83	6.35			12	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	37.40	3.23	49.83	7.38			12	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	37.40	3.23	49.83	7.38			12	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	49.86	4.27	49.83	8.42			12	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	49.86	4.27	49.83	8.42			12	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	62.32	5.31	49.83	9.46			12	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	62.32	5.31	49.83	9.46			12	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	74.77	6.35	49.83	10.50			12	114.4	12.49	1.15	49.83	5.31			12	51.9
	28	39.4	87.23	7.38	49.83	11.54			12	126.9	12.49	1.15	49.83	5.31			12	51.9
	26	39.4	87.23	7.38	49.83	11.54			12	126.9	12.49	1.15	49.83	5.31			12	51.9
	24	39.4	99.69	8.42	49.83	12.57			12	139.4	12.49	1.15	49.83	5.31			12	51.9
2000 - 6000 ADT	48	39.4	24.95	2.19	49.83	6.35			12	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	24.95	2.19	49.83	6.35			12	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	37.40	3.23	49.83	7.38			12	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	37.40	3.23	49.83	7.38			12	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	49.86	4.27	49.83	8.42			12	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	49.86	4.27	49.83	8.42			12	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	62.32	5.31	49.83	9.46			12	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	62.32	5.31	49.83	9.46			12	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	74.77	6.35	49.83	10.50			12	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	74.77	6.35	49.83	10.50			12	114.4	12.49	1.15	49.83	5.31			12	51.9
	28	39.4	87.23	7.38	49.83	11.54			12	126.9	12.49	1.15	49.83	5.31			12	51.9
	26	39.4	99.69	8.42	49.83	12.57			12	139.4	12.49	1.15	49.83	5.31			12	51.9
	24	39.4	99.69	8.42	49.83	12.57			12	139.4	24.95	2.19	49.83	6.35			12	64.4
OVER 6000 ADT	48	39.4	24.95	2.19	49.83	6.35			12	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	37.40	3.23	49.83	7.38			12	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	49.86	4.27	49.83	8.42			12	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	49.86	4.27	49.83	8.42			12	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	62.32	5.31	49.83	9.46			12	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	62.32	5.31	49.83	9.46			12	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	74.77	6.35	49.83	10.50			12	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	74.77	6.35	49.83	10.50			12	114.4	12.49	1.15	49.83	5.31			12	51.9
	32	39.4	87.23	7.38	49.83	11.54			12	126.9	12.49	1.15	49.83	5.31			12	51.9
	30	39.4	87.23	7.38	49.83	11.54			12	126.9	12.49	1.15	49.83	5.31			12	51.9
	28	39.4	99.69	8.42	49.83	12.57			12	139.4	12.49	1.15	49.83	5.31			12	51.9
	26	39.4	99.69	8.42	49.83	12.57			12	139.4	24.95	2.19	49.83	6.35			12	64.4
	24	39.4	112.14	9.46	49.83	13.61			12	151.9	24.95	2.19	49.83	6.35			12	64.4

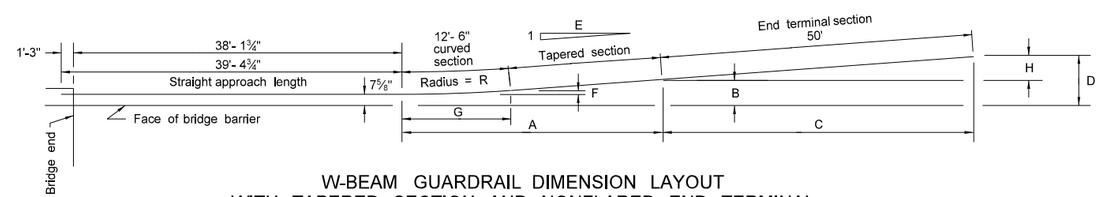
GUARDRAIL AT BRIDGE ENDS
55 MPH DESIGN SPEED



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH FLARED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH 50:1 TAPERED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH TAPERED SECTION AND NONFLARED END TERMINAL

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
55	0.52	12.49	4.15	150.35

NOTES:

On divided highways use distance from roadway centerline to bridge rail x 2 and use this as clear roadway width of the bridge to determine guardrail length.

The contractor shall use wood posts for W-beam guardrail.

(1) Does not include end terminal section

(2) The 39.4' straight approach length is for use with the transition shown on Standard Drawing D-764-3.

For the transition shown on Standard Drawing D-764-3A, revise straight approach length to 45.65'.

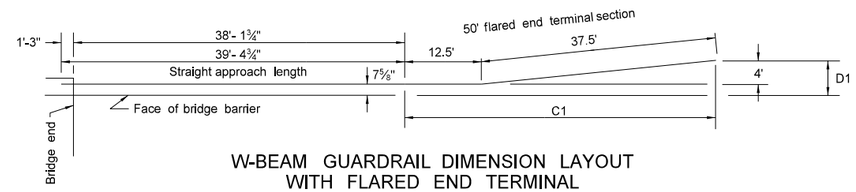
(3) Dimensions "B", "D" and "D1" include the 7⅝" (0.64') offset from the lower face of jersey barrier to the rear face of the W-beam guardrail.

For installations using the transition shown on Standard Drawing D-764-3A, subtract 0.64' from the dimensions "B", "D" and "D1", to obtain offset from face of guardrail connection plate.

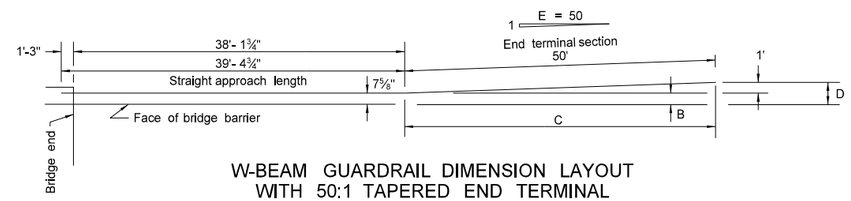
LENGTH OF NEED TABLE 60 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	CLEAR ROADWAY WIDTH OF BRIDGE	STRAIGHT APPROACH LENGTH (2)	APPROACH SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)	OPPOSITE SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)
		FT	FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT		FT
UNDER 750 ADT	48	39.4	12.49	1.08	49.87	4.64			14	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	12.49	1.08	49.87	4.64			14	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	12.49	1.08	49.87	4.64			14	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	24.96	1.97	49.87	5.53			14	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	24.96	1.97	49.87	5.53			14	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	37.43	2.86	49.87	6.42			14	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	49.89	3.75	49.87	7.32			14	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	49.89	3.75	49.87	7.32			14	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	62.36	4.64	49.87	8.21			14	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	74.83	5.53	49.87	9.10			14	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	74.83	5.53	49.87	9.10			14	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	26	39.4	87.30	6.42	49.87	9.99			14	126.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	24	39.4	99.77	7.32	49.87	10.88			14	139.4	12.49	1.08	49.87	4.64			14	51.9
750 - 1500 ADT	48	39.4	37.43	2.86	49.87	6.42			14	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	37.43	2.86	49.87	6.42			14	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	49.89	3.75	49.87	7.32			14	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	49.89	3.75	49.87	7.32			14	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	62.36	4.64	49.87	8.21			14	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	74.83	5.53	49.87	9.10			14	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	74.83	5.53	49.87	9.10			14	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	87.30	6.42	49.87	9.99			14	126.9	12.49	1.08	49.87	4.64			14	51.9
	32	39.4	87.30	6.42	49.87	9.99			14	126.9	12.49	1.08	49.87	4.64			14	51.9
	30	39.4	99.77	7.32	49.87	10.88			14	139.4	12.49	1.08	49.87	4.64			14	51.9
	28	39.4	99.77	7.32	49.87	10.88			14	139.4	24.96	1.97	49.87	5.53			14	64.4
	26	39.4	112.24	8.21	49.87	11.77			14	151.9	24.96	1.97	49.87	5.53			14	64.4
	24	39.4	124.70	9.10	49.87	12.66			14	164.4	37.43	2.86	49.87	6.42			14	76.9
1500 - 2000 ADT	48	39.4	62.36	4.64	49.87	8.21			14	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	62.36	4.64	49.87	8.21			14	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	74.83	5.53	49.87	9.10			14	114.4	12.49	1.08	49.87	4.64			14	51.9
	42	39.4	74.83	5.53	49.87	9.10			14	114.4	12.49	1.08	49.87	4.64			14	51.9
	40	39.4	87.30	6.42	49.87	9.99			14	126.9	12.49	1.08	49.87	4.64			14	51.9
	38	39.4	87.30	6.42	49.87	9.99			14	126.9	12.49	1.08	49.87	4.64			14	51.9
	36	39.4	99.77	7.32	49.87	10.88			14	139.4	24.96	1.97	49.87	5.53			14	64.4
	34	39.4	99.77	7.32	49.87	10.88			14	139.4	24.96	1.97	49.87	5.53			14	64.4
	32	39.4	112.24	8.21	49.87	11.77			14	151.9	37.43	2.86	49.87	6.42			14	76.9
	30	39.4	112.24	8.21	49.87	11.77			14	151.9	37.43	2.86	49.87	6.42			14	76.9
	28	39.4	124.70	9.10	49.87	12.66			14	164.4	49.89	3.75	49.87	7.32			14	89.4
	26	39.4	124.70	9.10	49.87	12.66			14	164.4	49.89	3.75	49.87	7.32			14	89.4
	24	39.4	137.17	9.99	49.87	13.55			14	176.9	62.36	4.64	49.87	8.21			14	101.9
2000 - 6000 ADT	48	39.4	74.83	5.53	49.87	9.10			14	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	74.83	5.53	49.87	9.10			14	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	87.30	6.42	49.87	9.99			14	126.9	12.49	1.08	49.87	4.64			14	51.9
	42	39.4	87.30	6.42	49.87	9.99			14	126.9	12.49	1.08	49.87	4.64			14	51.9
	40	39.4	99.77	7.32	49.87	10.88			14	139.4	12.49	1.08	49.87	4.64			14	51.9
	38	39.4	99.77	7.32	49.87	10.88			14	139.4	24.96	1.97	49.87	5.53			14	64.4
	36	39.4	112.24	8.21	49.87	11.77			14	151.9	24.96	1.97	49.87	5.53			14	64.4
	34	39.4	124.70	9.10	49.87	12.66			14	164.4	37.43	2.86	49.87	6.42			14	76.9
	32	39.4	124.70	9.10	49.87	12.66			14	164.4	37.43	2.86	49.87	6.42			14	76.9
	30	39.4	137.17	9.99	49.87	13.55			14	176.9	49.89	3.75	49.87	7.32			14	89.4
	28	39.4	137.17	9.99	49.87	13.55			14	176.9	62.36	4.64	49.87	8.21			14	101.9
	26	39.4	149.64	10.88	49.87	14.44			14	189.4	62.36	4.64	49.87	8.21			14	101.9
	24	39.4	149.64	10.88	49.87	14.44			14	189.4	74.83	5.53	49.87	9.10			14	114.4
OVER 6000 ADT	48	39.4	87.30	6.42	49.87	9.99			14	126.9	12.49	1.08	49.87	4.64			14	51.9
	46	39.4	87.30	6.42	49.87	9.99			14	126.9	12.49	1.08	49.87	4.64			14	51.9
	44	39.4	99.77	7.32	49.87	10.88			14	139.4	12.49	1.08	49.87	4.64			14	51.9
	42	39.4	99.77	7.32	49.87	10.88			14	139.4	24.96	1.97	49.87	5.53			14	64.4
	40	39.4	112.24	8.21	49.87	11.77			14	151.9	24.96	1.97	49.87	5.53			14	64.4
	38	39.4	112.24	8.21	49.87	11.77			14	151.9	37.43	2.86	49.87	6.42			14	76.9
	36	39.4	124.70	9.10	49.87	12.66			14	164.4	37.43	2.86	49.87	6.42			14	76.9
	34	39.4	137.17	9.99	49.87	13.55			14	176.9	49.89	3.75	49.87	7.32			14	89.4
	32	39.4	137.17	9.99	49.87	13.55			14	176.9	62.36	4.64	49.87	8.21			14	101.9
	30	39.4	149.64	10.88	49.87	14.44			14	189.4	62.36	4.64	49.87	8.21			14	101.9
	28	39.4	149.64	10.88	49.87	14.44			14	189.4	74.83	5.53	49.87	9.10			14	114.4
	26	39.4	162.11	11.77	49.87	15.33			14	201.9	74.83	5.53	49.87	9.10			14	114.4
	24	39.4	162.11	11.77	49.87	15.33			14	201.9	87.30	6.42	49.87	9.99			14	126.9

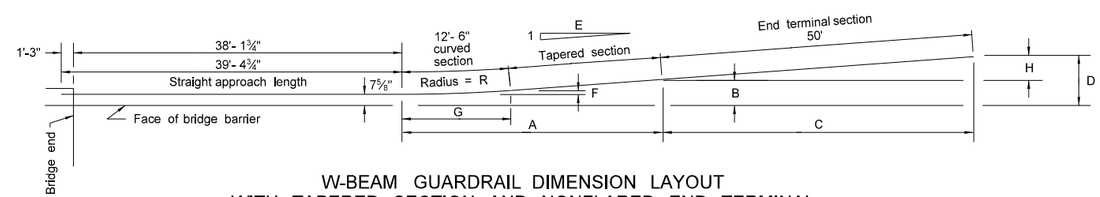
GUARDRAIL AT BRIDGE ENDS
60 MPH DESIGN SPEED



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH FLARED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH 50:1 TAPERED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH TAPERED SECTION AND NONFLARED END TERMINAL

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
60	0.45	12.49	3.56	175.30

NOTES:

On divided highways use distance from roadway centerline to bridge rail x 2 and use this as clear roadway width of the bridge to determine guardrail length.

The contractor shall use wood posts for W-beam guardrail.

(1) Does not include end terminal section

(2) The 39.4' straight approach length is for use with the transition shown on Standard Drawing D-764-3.

For the transition shown on Standard Drawing D-764-3A, revise straight approach length to 45.65'.

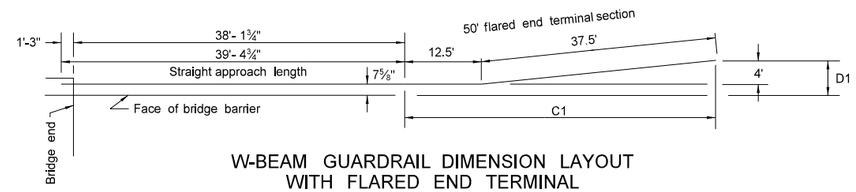
(3) Dimensions "B", "D" and "D1" include the 7⅝" (0.64') offset from the lower face of jersey barrier to the rear face of the W-beam guardrail.

For installations using the transition shown on Standard Drawing D-764-3A, subtract 0.64' from the dimensions "B", "D" and "D1", to obtain offset from face of guardrail connection plate.

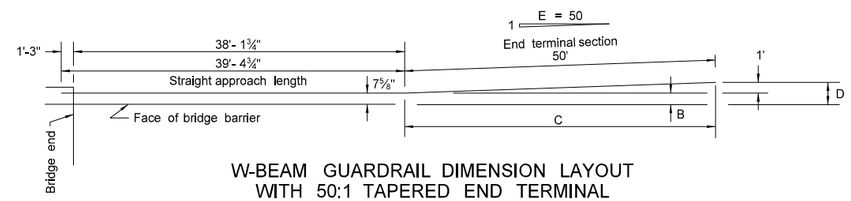
LENGTH OF NEED TABLE 65 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	CLEAR ROADWAY WIDTH OF BRIDGE	STRAIGHT APPROACH LENGTH (2)	APPROACH SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)	OPPOSITE SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)
		FT	FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT		FT
UNDER 750 ADT	48	39.4	12.49	1.05	49.89	4.38			15	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	24.96	1.88	49.89	5.21			15	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	24.96	1.88	49.89	5.21			15	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	37.43	2.71	49.89	6.04			15	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	49.91	3.55	49.89	6.87			15	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	49.91	3.55	49.89	6.87			15	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	62.38	4.38	49.89	7.70			15	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	74.85	5.21	49.89	8.53			15	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	74.85	5.21	49.89	8.53			15	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	87.32	6.04	49.89	9.37			15	126.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	99.80	6.87	49.89	10.20			15	139.4	12.49	1.05	49.89	4.38			15	51.9
	26	39.4	99.80	6.87	49.89	10.20			15	139.4	12.49	1.05	49.89	4.38			15	51.9
	24	39.4	112.27	7.70	49.89	11.03			15	151.9	12.49	1.05	49.89	4.38			15	51.9
750 - 1500 ADT	48	39.4	49.91	3.55	49.89	6.87			15	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	62.38	4.38	49.89	7.70			15	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	62.38	4.38	49.89	7.70			15	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	74.85	5.21	49.89	8.53			15	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	74.85	5.21	49.89	8.53			15	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	87.32	6.04	49.89	9.37			15	126.9	12.49	1.05	49.89	4.38			15	51.9
	36	39.4	99.80	6.87	49.89	10.20			15	139.4	12.49	1.05	49.89	4.38			15	51.9
	34	39.4	99.80	6.87	49.89	10.20			15	139.4	12.49	1.05	49.89	4.38			15	51.9
	32	39.4	112.27	7.70	49.89	11.03			15	151.9	24.96	1.88	49.89	5.21			15	64.4
	30	39.4	112.27	7.70	49.89	11.03			15	151.9	24.96	1.88	49.89	5.21			15	64.4
	28	39.4	124.74	8.53	49.89	11.86			15	164.4	37.43	2.71	49.89	6.04			15	76.9
	26	39.4	124.74	8.53	49.89	11.86			15	164.4	37.43	2.71	49.89	6.04			15	76.9
	24	39.4	137.21	9.37	49.89	12.69			15	176.9	49.91	3.55	49.89	6.87			15	89.4
1500 - 2000 ADT	48	39.4	74.85	5.21	49.89	8.53			15	114.4	12.49	1.05	49.89	4.38			15	51.9
	46	39.4	87.32	6.04	49.89	9.37			15	126.9	12.49	1.05	49.89	4.38			15	51.9
	44	39.4	87.32	6.04	49.89	9.37			15	126.9	12.49	1.05	49.89	4.38			15	51.9
	42	39.4	99.80	6.87	49.89	10.20			15	139.4	12.49	1.05	49.89	4.38			15	51.9
	40	39.4	99.80	6.87	49.89	10.20			15	139.4	24.96	1.88	49.89	5.21			15	64.4
	38	39.4	112.27	7.70	49.89	11.03			15	151.9	24.96	1.88	49.89	5.21			15	64.4
	36	39.4	112.27	7.70	49.89	11.03			15	151.9	37.43	2.71	49.89	6.04			15	76.9
	34	39.4	124.74	8.53	49.89	11.86			15	164.4	49.91	3.55	49.89	6.87			15	89.4
	32	39.4	124.74	8.53	49.89	11.86			15	164.4	49.91	3.55	49.89	6.87			15	89.4
	30	39.4	137.21	9.37	49.89	12.69			15	176.9	62.38	4.38	49.89	7.70			15	101.9
	28	39.4	137.21	9.37	49.89	12.69			15	176.9	62.38	4.38	49.89	7.70			15	101.9
	26	39.4	149.69	10.20	49.89	13.52			15	189.4	74.85	5.21	49.89	8.53			15	114.4
	24	39.4	149.69	10.20	49.89	13.52			15	189.4	74.85	5.21	49.89	8.53			15	114.4
2000 - 6000 ADT	48	39.4	87.32	6.04	49.89	9.37			15	126.9	12.49	1.05	49.89	4.38			15	51.9
	46	39.4	99.80	6.87	49.89	10.20			15	139.4	12.49	1.05	49.89	4.38			15	51.9
	44	39.4	99.80	6.87	49.89	10.20			15	139.4	12.49	1.05	49.89	4.38			15	51.9
	42	39.4	112.27	7.70	49.89	11.03			15	151.9	24.96	1.88	49.89	5.21			15	64.4
	40	39.4	112.27	7.70	49.89	11.03			15	151.9	37.43	2.71	49.89	6.04			15	76.9
	38	39.4	124.74	8.53	49.89	11.86			15	164.4	37.43	2.71	49.89	6.04			15	76.9
	36	39.4	124.74	8.53	49.89	11.86			15	164.4	49.91	3.55	49.89	6.87			15	89.4
	34	39.4	137.21	9.37	49.89	12.69			15	176.9	49.91	3.55	49.89	6.87			15	89.4
	32	39.4	149.69	10.20	49.89	13.52			15	189.4	62.38	4.38	49.89	7.70			15	101.9
	30	39.4	149.69	10.20	49.89	13.52			15	189.4	62.38	4.38	49.89	7.70			15	101.9
	28	39.4	162.16	11.03	49.89	14.36			15	201.9	74.85	5.21	49.89	8.53			15	114.4
	26	39.4	162.16	11.03	49.89	14.36			15	201.9	74.85	5.21	49.89	8.53			15	114.4
	24	39.4	174.63	11.86	49.89	15.19			15	214.4	87.32	6.04	49.89	9.37			15	126.9
OVER 6000 ADT	48	39.4	99.80	6.87	49.89	10.20			15	139.4	12.49	1.05	49.89	4.38			15	51.9
	46	39.4	112.27	7.70	49.89	11.03			15	151.9	24.96	1.88	49.89	5.21			15	64.4
	44	39.4	112.27	7.70	49.89	11.03			15	151.9	37.43	2.71	49.89	6.04			15	76.9
	42	39.4	124.74	8.53	49.89	11.86			15	164.4	37.43	2.71	49.89	6.04			15	76.9
	40	39.4	124.74	8.53	49.89	11.86			15	164.4	49.91	3.55	49.89	6.87			15	89.4
	38	39.4	137.21	9.37	49.89	12.69			15	176.9	49.91	3.55	49.89	6.87			15	89.4
	36	39.4	149.69	10.20	49.89	13.52			15	189.4	62.38	4.38	49.89	7.70			15	101.9
	34	39.4	149.69	10.20	49.89	13.52			15	189.4	62.38	4.38	49.89	7.70			15	101.9
	32	39.4	162.16	11.03	49.89	14.36			15	201.9	74.85	5.21	49.89	8.53			15	114.4
	30	39.4	162.16	11.03	49.89	14.36			15	201.9	74.85	5.21	49.89	8.53			15	114.4
	28	39.4	174.63	11.86	49.89	15.19			15	214.4	87.32	6.04	49.89	9.37			15	126.9
	26	39.4	174.63	11.86	49.89	15.19			15	214.4	99.80	6.87	49.89	10.20			15	139.4
	24	39.4	187.10	12.69	49.89	15.02			15	226.9	99.80	6.87	49.89	10.20			15	139.4

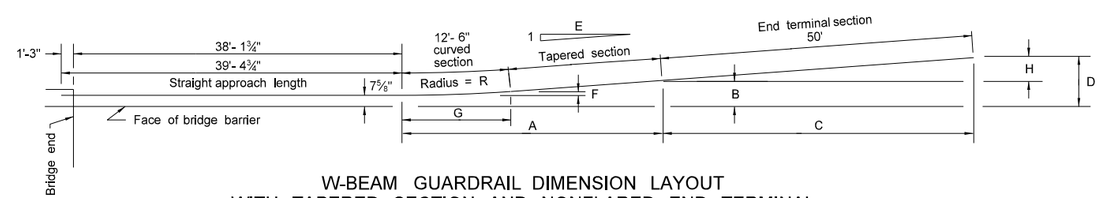
GUARDRAIL AT BRIDGE ENDS
65 MPH DESIGN SPEED



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH FLARED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH 50:1 TAPERED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH TAPERED SECTION AND NONFLARED END TERMINAL

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
65	0.42	12.49	3.33	187.78

NOTES:

On divided highways use distance from roadway centerline to bridge rail x 2 and use this as clear roadway width of the bridge to determine guardrail length.

The contractor shall use wood posts for W-beam guardrail.

(1) Does not include end terminal section

(2) The 39.4' straight approach length is for use with the transition shown on Standard Drawing D-764-3.

For the transition shown on Standard Drawing D-764-3A, revise straight approach length to 45.65'.

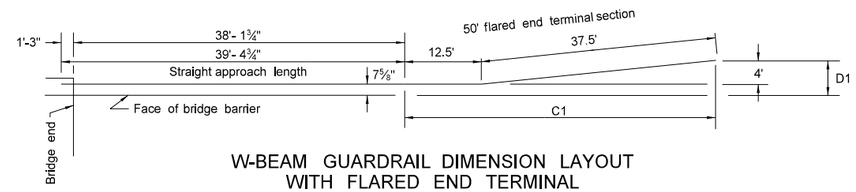
(3) Dimensions "B", "D" and "D1" include the 7⅝" (0.64') offset from the lower face of jersey barrier to the rear face of the W-beam guardrail.

For installations using the transition shown on Standard Drawing D-764-3A, subtract 0.64' from the dimensions "B", "D" and "D1", to obtain offset from face of guardrail connection plate.

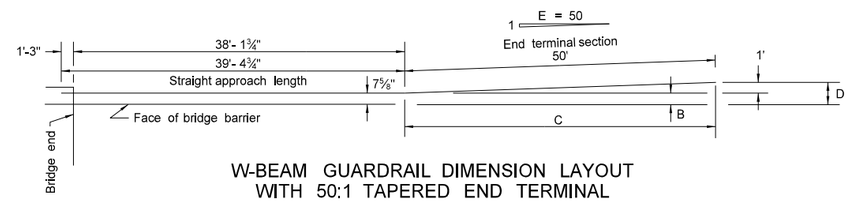
LENGTH OF NEED TABLE 70 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	CLEAR ROADWAY WIDTH OF BRIDGE	STRAIGHT APPROACH LENGTH (2)	APPROACH SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)	OPPOSITE SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)
		FT	FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT		FT
UNDER 750 ADT	48	39.4	12.49	1.05	49.89	4.38			15	51.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	24.96	1.88	49.89	5.21			15	64.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	37.43	2.71	49.89	6.04			15	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	37.43	2.71	49.89	6.04			15	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	49.91	3.55	49.89	6.87			15	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	49.91	3.55	49.89	6.87			15	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	62.38	4.38	49.89	7.70			15	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	74.85	5.21	49.89	8.53			15	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	74.85	5.21	49.89	8.53			15	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	30	39.4	87.32	6.04	49.89	9.37			15	126.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	28	39.4	99.80	6.87	49.89	10.20			15	139.4	12.49	1.05	49.89	4.38			15	51.9
	26	39.4	99.80	6.87	49.89	10.20			15	139.4	12.49	1.05	49.89	4.38			15	51.9
	24	39.4	112.27	7.70	49.89	11.03			15	151.9	12.49	1.05	49.89	4.38			15	51.9
750 - 1500 ADT	48	39.4	49.91	3.55	49.89	6.87			15	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	62.38	4.38	49.89	7.70			15	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	74.85	5.21	49.89	8.53			15	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	74.85	5.21	49.89	8.53			15	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	87.32	6.04	49.89	9.37			15	126.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	87.32	6.04	49.89	9.37			15	126.9	12.49	1.05	49.89	4.38			15	51.9
	36	39.4	99.80	6.87	49.89	10.20			15	139.4	12.49	1.05	49.89	4.38			15	51.9
	34	39.4	112.27	7.70	49.89	11.03			15	151.9	12.49	1.05	49.89	4.38			15	51.9
	32	39.4	112.27	7.70	49.89	11.03			15	151.9	24.96	1.88	49.89	5.21			15	64.4
	30	39.4	124.74	8.53	49.89	11.86			15	164.4	37.43	2.71	49.89	6.04			15	76.9
	28	39.4	124.74	8.53	49.89	11.86			15	164.4	37.43	2.71	49.89	6.04			15	76.9
	26	39.4	137.21	9.37	49.89	12.69			15	176.9	49.91	3.55	49.89	6.87			15	89.4
	24	39.4	149.69	10.20	49.89	13.52			15	189.4	49.91	3.55	49.89	6.87			15	89.4
1500 - 2000 ADT	48	39.4	87.32	6.04	49.89	9.37			15	126.9	12.49	1.05	49.89	4.38			15	51.9
	46	39.4	87.32	6.04	49.89	9.37			15	126.9	12.49	1.05	49.89	4.38			15	51.9
	44	39.4	99.80	6.87	49.89	10.20			15	139.4	12.49	1.05	49.89	4.38			15	51.9
	42	39.4	99.80	6.87	49.89	10.20			15	139.4	24.96	1.88	49.89	5.21			15	64.4
	40	39.4	112.27	7.70	49.89	11.03			15	151.9	24.96	1.88	49.89	5.21			15	64.4
	38	39.4	112.27	7.70	49.89	11.03			15	151.9	37.43	2.71	49.89	6.04			15	76.9
	36	39.4	124.74	8.53	49.89	11.86			15	164.4	37.43	2.71	49.89	6.04			15	76.9
	34	39.4	124.74	8.53	49.89	11.86			15	164.4	49.91	3.55	49.89	6.87			15	89.4
	32	39.4	137.21	9.37	49.89	12.69			15	176.9	49.91	3.55	49.89	6.87			15	89.4
	30	39.4	137.21	9.37	49.89	12.69			15	176.9	62.38	4.38	49.89	7.70			15	101.9
	28	39.4	149.69	10.20	49.89	13.52			15	189.4	62.38	4.38	49.89	7.70			15	101.9
	26	39.4	162.16	11.03	49.89	14.36			15	201.9	74.85	5.21	49.89	8.53			15	114.4
	24	39.4	162.16	11.03	49.89	14.36			15	201.9	87.32	6.04	49.89	9.37			15	126.9
2000 - 6000 ADT	48	39.4	87.32	6.04	49.89	9.37			15	126.9	12.49	1.05	49.89	4.38			15	51.9
	46	39.4	99.80	6.87	49.89	10.20			15	139.4	12.49	1.05	49.89	4.38			15	51.9
	44	39.4	112.27	7.70	49.89	11.03			15	151.9	24.96	1.88	49.89	5.21			15	64.4
	42	39.4	112.27	7.70	49.89	11.03			15	151.9	24.96	1.88	49.89	5.21			15	64.4
	40	39.4	124.74	8.53	49.89	11.86			15	164.4	37.43	2.71	49.89	6.04			15	76.9
	38	39.4	124.74	8.53	49.89	11.86			15	164.4	37.43	2.71	49.89	6.04			15	76.9
	36	39.4	137.21	9.37	49.89	12.69			15	176.9	49.91	3.55	49.89	6.87			15	89.4
	34	39.4	137.21	9.37	49.89	12.69			15	176.9	49.91	3.55	49.89	6.87			15	89.4
	32	39.4	149.69	10.20	49.89	13.52			15	189.4	62.38	4.38	49.89	7.70			15	101.9
	30	39.4	162.16	11.03	49.89	14.36			15	201.9	74.85	5.21	49.89	8.53			15	114.4
	28	39.4	162.16	11.03	49.89	14.36			15	201.9	74.85	5.21	49.89	8.53			15	114.4
	26	39.4	174.63	11.86	49.89	15.19			15	214.4	87.32	6.04	49.89	9.37			15	126.9
	24	39.4	174.63	11.86	49.89	15.19			15	214.4	87.32	6.04	49.89	9.37			15	126.9
OVER 6000 ADT	48	39.4	112.27	7.70	49.89	11.03			15	151.9	24.96	1.88	49.89	5.21			15	64.4
	46	39.4	112.27	7.70	49.89	11.03			15	151.9	24.96	1.88	49.89	5.21			15	64.4
	44	39.4	124.74	8.53	49.89	11.86			15	164.4	37.43	2.71	49.89	6.04			15	76.9
	42	39.4	124.74	8.53	49.89	11.86			15	164.4	37.43	2.71	49.89	6.04			15	76.9
	40	39.4	137.21	9.37	49.89	12.69			15	176.9	49.91	3.55	49.89	6.87			15	89.4
	38	39.4	137.21	9.37	49.89	12.69			15	176.9	49.91	3.55	49.89	6.87			15	89.4
	36	39.4	149.69	10.20	49.89	13.52			15	189.4	62.38	4.38	49.89	7.70			15	101.9
	34	39.4	162.16	11.03	49.89	14.36			15	201.9	74.85	5.21	49.89	8.53			15	114.4
	32	39.4	162.16	11.03	49.89	14.36			15	201.9	74.85	5.21	49.89	8.53			15	114.4
	30	39.4	174.63	11.86	49.89	15.19			15	214.4	87.32	6.04	49.89	9.37			15	126.9
	28	39.4	174.63	11.86	49.89	15.19			15	214.4	87.32	6.04	49.89	9.37			15	126.9
	26	39.4	187.10	12.69	49.89	16.02			15	226.9	99.80	6.87	49.89	10.20			15	139.4
	24	39.4	199.57	13.52	49.89	16.85			15	239.4	112.27	7.70	49.89	11.03			15	151.9

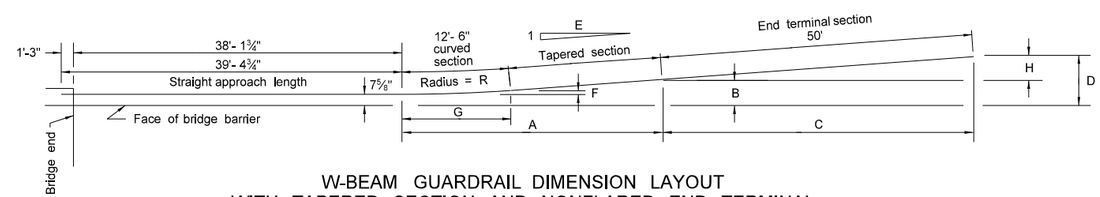
GUARDRAIL AT BRIDGE ENDS
70 MPH DESIGN SPEED



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH FLARED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH 50:1 TAPERED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH TAPERED SECTION AND NONFLARED END TERMINAL

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
70	0.42	12.49	3.33	187.78

NOTES:

On divided highways use distance from roadway centerline to bridge rail x 2 and use this as clear roadway width of the bridge to determine guardrail length.

The contractor shall use wood posts for W-beam guardrail.

(1) Does not include end terminal section

(2) The 39.4' straight approach length is for use with the transition shown on Standard Drawing D-764-3.

For the transition shown on Standard Drawing D-764-3A, revise straight approach length to 45.65'.

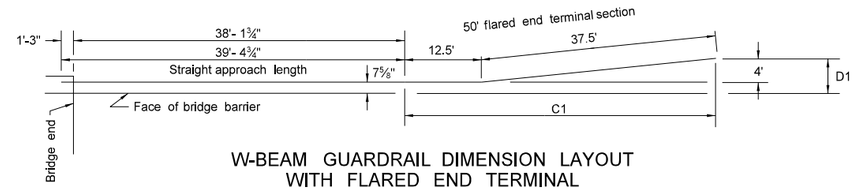
(3) Dimensions "B", "D" and "D1" include the 7⅝" (0.64') offset from the lower face of jersey barrier to the rear face of the W-beam guardrail.

For installations using the transition shown on Standard Drawing D-764-3A, subtract 0.64' from the dimensions "B", "D" and "D1", to obtain offset from face of guardrail connection plate.

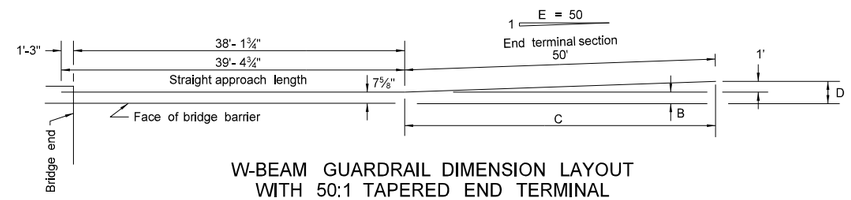
LENGTH OF NEED TABLE 75 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	CLEAR ROADWAY WIDTH OF BRIDGE	STRAIGHT APPROACH LENGTH (2)	APPROACH SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)	OPPOSITE SIDE A	B (3)	C	D (3)	C1	D1 (3)	E	TOTAL W-BEAM LENGTH (1)
		FT	FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT		FT
UNDER 750 ADT	48	39.4	37.44	2.58	49.90	5.70			16	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	37.44	2.58	49.90	5.70			16	76.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	44	39.4	49.92	3.36	49.90	6.48			16	89.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	42	39.4	62.39	4.14	49.90	7.26			16	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	40	39.4	62.39	4.14	49.90	7.26			16	101.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	38	39.4	74.87	4.92	49.90	8.04			16	114.4	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	36	39.4	87.34	5.70	49.90	8.82			16	126.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	34	39.4	87.34	5.70	49.90	8.82			16	126.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	32	39.4	99.82	6.48	49.90	9.60			16	139.4	12.49	1.03	49.90	4.14			16	51.9
	30	39.4	112.30	7.26	49.90	10.38			16	151.9	12.49	1.03	49.90	4.14			16	51.9
	28	39.4	112.30	7.26	49.90	10.38			16	151.9	12.49	1.03	49.90	4.14			16	51.9
	26	39.4	124.77	8.04	49.90	11.16			16	164.4	24.97	1.81	49.90	4.92			16	64.4
	24	39.4	137.25	8.82	49.90	11.94			16	176.9	37.44	2.58	49.90	5.70			16	76.9
750 - 1500 ADT	48	39.4	87.34	5.70	49.90	8.82			16	126.9	0.00	0.64	49.99	1.64	49.79	4.64	50	39.4
	46	39.4	87.34	5.70	49.90	8.82			16	126.9	12.49	1.03	49.90	4.14			16	51.9
	44	39.4	99.82	6.48	49.90	9.60			16	139.4	12.49	1.03	49.90	4.14			16	51.9
	42	39.4	99.82	6.48	49.90	9.60			16	139.4	12.49	1.03	49.90	4.14			16	51.9
	40	39.4	112.30	7.26	49.90	10.38			16	151.9	24.97	1.81	49.90	4.92			16	64.4
	38	39.4	124.77	8.04	49.90	11.16			16	164.4	24.97	1.81	49.90	4.92			16	64.4
	36	39.4	124.77	8.04	49.90	11.16			16	164.4	37.44	2.58	49.90	5.70			16	76.9
	34	39.4	137.25	8.82	49.90	11.94			16	176.9	49.92	3.36	49.90	6.48			16	89.4
	32	39.4	137.25	8.82	49.90	11.94			16	176.9	49.92	3.36	49.90	6.48			16	89.4
	30	39.4	149.72	9.60	49.90	12.72			16	189.4	62.39	4.14	49.90	7.26			16	101.9
	28	39.4	162.20	10.38	49.90	13.50			16	201.9	62.39	4.14	49.90	7.26			16	101.9
	26	39.4	162.20	10.38	49.90	13.50			16	201.9	74.87	4.92	49.90	8.04			16	114.4
	24	39.4	174.67	11.16	49.90	14.28			16	214.4	87.34	5.70	49.90	8.82			16	126.9
1500 - 2000 ADT	48	39.4	112.30	7.26	49.90	10.38			16	151.9	24.97	1.81	49.90	4.92			16	64.4
	46	39.4	112.30	7.26	49.90	10.38			16	151.9	37.44	2.58	49.90	5.70			16	76.9
	44	39.4	124.77	8.04	49.90	11.16			16	164.4	37.44	2.58	49.90	5.70			16	76.9
	42	39.4	124.77	8.04	49.90	11.16			16	164.4	49.92	3.36	49.90	6.48			16	89.4
	40	39.4	137.25	8.82	49.90	11.94			16	176.9	49.92	3.36	49.90	6.48			16	89.4
	38	39.4	149.72	9.60	49.90	12.72			16	189.4	62.39	4.14	49.90	7.26			16	101.9
	36	39.4	149.72	9.60	49.90	12.72			16	189.4	62.39	4.14	49.90	7.26			16	101.9
	34	39.4	162.20	10.38	49.90	13.50			16	201.9	74.87	4.92	49.90	8.04			16	114.4
	32	39.4	162.20	10.38	49.90	13.50			16	201.9	87.34	5.70	49.90	8.82			16	126.9
	30	39.4	174.67	11.16	49.90	14.28			16	214.4	87.34	5.70	49.90	8.82			16	126.9
	28	39.4	174.67	11.16	49.90	14.28			16	214.4	99.82	6.48	49.90	9.60			16	139.4
	26	39.4	187.15	11.94	49.90	15.06			16	226.9	99.82	6.48	49.90	9.60			16	139.4
	24	39.4	187.15	11.94	49.90	15.06			16	226.9	112.30	7.26	49.90	10.38			16	151.9
2000 - 6000 ADT	48	39.4	124.77	8.04	49.90	11.16			16	164.4	37.44	2.58	49.90	5.70			16	76.9
	46	39.4	124.77	8.04	49.90	11.16			16	164.4	37.44	2.58	49.90	5.70			16	76.9
	44	39.4	137.25	8.82	49.90	11.94			16	176.9	49.92	3.36	49.90	6.48			16	89.4
	42	39.4	149.72	9.60	49.90	12.72			16	189.4	49.92	3.36	49.90	6.48			16	89.4
	40	39.4	149.72	9.60	49.90	12.72			16	189.4	62.39	4.14	49.90	7.26			16	101.9
	38	39.4	162.20	10.38	49.90	13.50			16	201.9	74.87	4.92	49.90	8.04			16	114.4
	36	39.4	162.20	10.38	49.90	13.50			16	201.9	74.87	4.92	49.90	8.04			16	114.4
	34	39.4	174.67	11.16	49.90	14.28			16	214.4	87.34	5.70	49.90	8.82			16	126.9
	32	39.4	174.67	11.16	49.90	14.28			16	214.4	87.34	5.70	49.90	8.82			16	126.9
	30	39.4	187.15	11.94	49.90	15.06			16	226.9	99.82	6.48	49.90	9.60			16	139.4
	28	39.4	199.62	12.72	49.90	15.84			16	239.4	112.30	7.26	49.90	10.38			16	151.9
	26	39.4	199.62	12.72	49.90	15.84			16	239.4	112.30	7.26	49.90	10.38			16	151.9
	24	39.4	212.10	13.50	49.90	16.62			16	251.9	124.77	8.04	49.90	11.16			16	164.4
OVER 6000 ADT	48	39.4	137.25	8.82	49.90	11.94			16	176.9	49.92	3.36	49.90	6.48			16	89.4
	46	39.4	149.72	9.60	49.90	12.72			16	189.4	62.39	4.14	49.90	7.26			16	101.9
	44	39.4	162.20	10.38	49.90	13.50			16	201.9	74.87	4.92	49.90	8.04			16	114.4
	42	39.4	162.20	10.38	49.90	13.50			16	201.9	74.87	4.92	49.90	8.04			16	114.4
	40	39.4	174.67	11.16	49.90	14.28			16	214.4	87.34	5.70	49.90	8.82			16	126.9
	38	39.4	174.67	11.16	49.90	14.28			16	214.4	87.34	5.70	49.90	8.82			16	126.9
	36	39.4	187.15	11.94	49.90	15.06			16	226.9	99.82	6.48	49.90	9.60			16	139.4
	34	39.4	199.62	12.72	49.90	15.84			16	239.4	112.30	7.26	49.90	10.38			16	151.9
	32	39.4	199.62	12.72	49.90	15.84			16	239.4	112.30	7.26	49.90	10.38			16	151.9
	30	39.4	212.10	13.50	49.90	16.62			16	251.9	124.77	8.04	49.90	11.16			16	164.4
	28	39.4	212.10	13.50	49.90	16.62			16	251.9	124.77	8.04	49.90	11.16			16	164.4
	26	39.4	224.58	14.28	49.90	17.40			16	264.4	137.25	8.82	49.90	11.94			16	176.9
	24	39.4	224.58	14.28	49.90	17.40			16	264.4	137.25	8.82	49.90	11.94			16	176.9

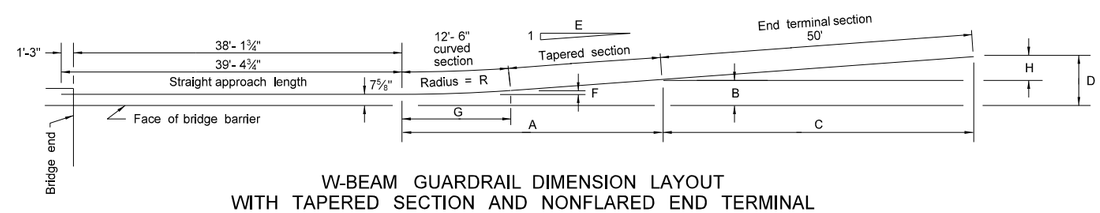
GUARDRAIL AT BRIDGE ENDS
75 MPH DESIGN SPEED



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH FLARED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH 50:1 TAPERED END TERMINAL



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH TAPERED SECTION AND NONFLARED END TERMINAL

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
75	0.39	12.49	3.12	200.26

NOTES:

On divided highways use distance from roadway centerline to bridge rail x 2 and use this as clear roadway width of the bridge to determine guardrail length.

The contractor shall use wood posts for W-beam guardrail.

(1) Does not include end terminal section

(2) The 39.4' straight approach length is for use with the transition shown on Standard Drawing D-764-3.

For the transition shown on Standard Drawing D-764-3A, revise straight approach length to 45.65'.

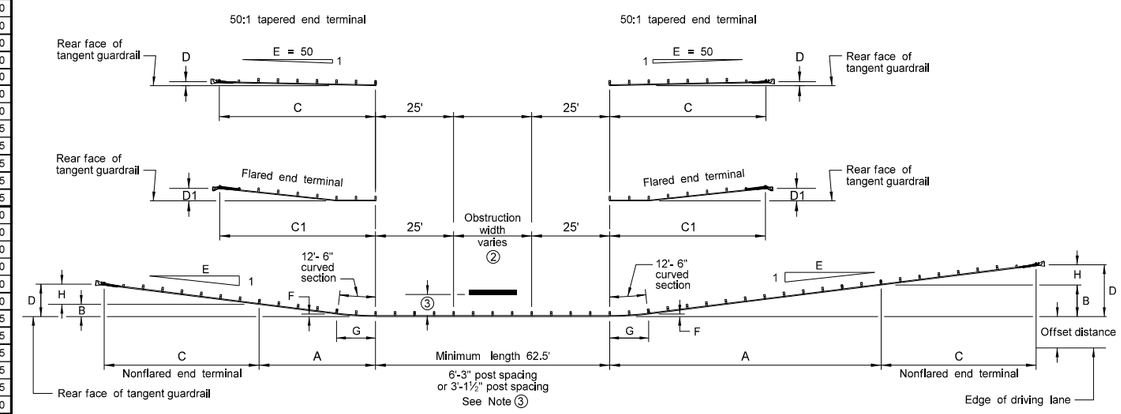
(3) Dimensions "B", "D" and "D1" include the 7⅝" (0.64') offset from the lower face of jersey barrier to the rear face of the W-beam guardrail.

For installations using the transition shown on Standard Drawing D-764-3A, subtract 0.64' from the dimensions "B", "D" and "D1", to obtain offset from face of guardrail connection plate.

LENGTH OF NEED TABLE 30 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	APPROACH SIDE A	B	C	D	C1	D1	E	OPPOSITE SIDE A	B	C	D	C1	D1	E	TOTAL W-BEAM LENGTH ① 0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	11	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	10	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	9	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	8	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	7	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	6	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	5	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	4	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	3	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	2	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	1	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	0	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
750 - 1500 ADT	12	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	11	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	10	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	9	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	8	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	7	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	6	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	5	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	4	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	3	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	2	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	1	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	0	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
1500 - 2000 ADT	12	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	11	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	10	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	9	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	8	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	7	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	6	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	5	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	4	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	3	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	2	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	1	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	0	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
2000 - 6000 ADT	12	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	11	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	10	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	9	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	8	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	7	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	6	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	5	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	4	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	3	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	2	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	1	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	0	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
OVER 6000 ADT	12	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	11	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	10	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	9	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	8	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	7	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	6	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	5	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	4	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	3	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	2	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	1	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	0	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5

GUARDRAIL AT OBSTRUCTIONS
30 MPH DESIGN LENGTH OF NEED TABLES



W-BEAM GUARDRAIL DIMENSION LAYOUT

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
30	0.62	12.48	4.98	125.42

NOTES:

The contractor shall use wood posts for the W-beam guardrail and end terminal section.

① Does not include end terminal section.

② The width of the obstruction shall be rounded up to the nearest 12'-6" length.

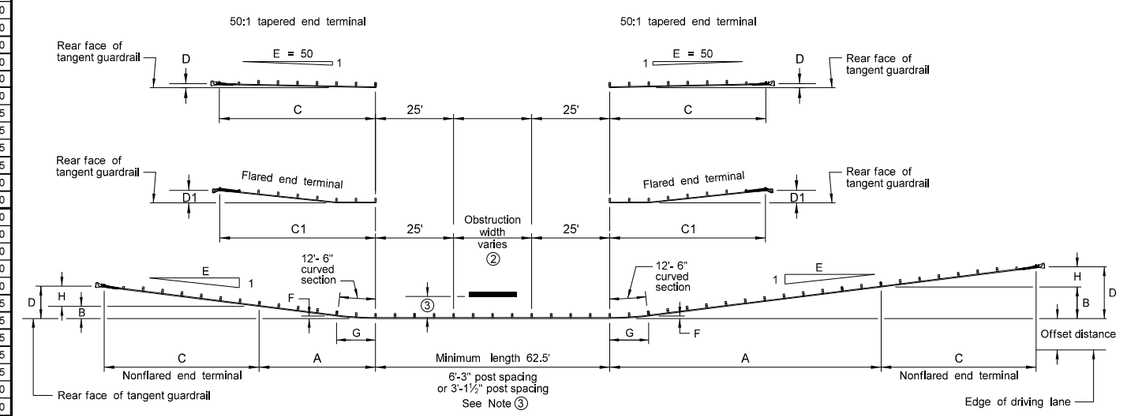
③ Where distance from rear face of W-beam railing to a fixed object is 3' or more, post spacing in this area shall be 6'-3".

Where distance from rear face of W-beam railing to a fixed object is less than 3', post spacing in this area shall be 3'-1½".

LENGTH OF NEED TABLE 40 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	APPROACH SIDE A	B	C	D	C1	D1	E	OPPOSITE SIDE A	B	C	D	C1	D1	E	TOTAL W-BEAM LENGTH ① 0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	11	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	10	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	9	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	8	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	7	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	6	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	5	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	4	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	3	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	2	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	1	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	0	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
750 - 1500 ADT	12	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	11	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	10	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	9	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	8	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	7	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	6	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	5	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	4	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	3	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	2	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	1	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	0	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
1500 - 2000 ADT	12	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	11	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	10	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	9	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	8	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	7	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	6	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	5	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	4	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	3	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	2	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	1	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	0	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
2000 - 6000 ADT	12	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	11	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	10	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	9	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	8	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	7	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	6	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	5	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	4	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	3	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	2	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	1	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	0	49.79	4.35	49.75	9.33			10	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
OVER 6000 ADT	12	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	11	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	10	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	9	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	8	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	7	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	6	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	5	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	4	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	3	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	2	49.79	4.35	49.75	9.33			10	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	1	49.79	4.35	49.75	9.33			10	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	0	62.23	5.60	49.75	10.57			10	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5

GUARDRAIL AT OBSTRUCTIONS
40 MPH DESIGN LENGTH OF NEED TABLES



W-BEAM GUARDRAIL DIMENSION LAYOUT

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
40	0.62	12.48	4.98	125.42

NOTES:

The contractor shall use wood posts for the W-beam guardrail and end terminal section.

① Does not include end terminal section.

② The width of the obstruction shall be rounded up to the nearest 12'-6" length.

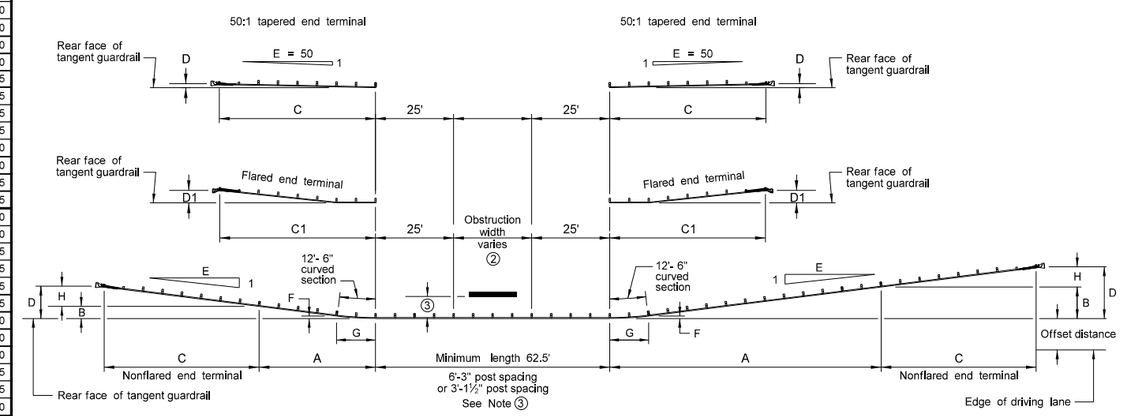
③ Where distance from rear face of W-beam railing to a fixed object is 3' or more, post spacing in this area shall be 6'-3".

Where distance from rear face of W-beam railing to a fixed object is less than 3', post spacing in this area shall be 3'-1½".

LENGTH OF NEED TABLE 45 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	APPROACH SIDE A	B	C	D	C1	D1	E	OPPOSITE SIDE A	B	C	D	C1	D1	E	TOTAL W-BEAM LENGTH ① 0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	11	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	10	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	9	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	8	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	7	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	6	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	5	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	4	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	3	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	2	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	1	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	0	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
750 - 1500 ADT	12	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	11	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	10	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	9	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	8	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	7	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	6	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	5	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	4	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	3	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	2	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	1	49.79	4.35	49.75	9.33			10	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	0	49.79	4.35	49.75	9.33			10	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
1500 - 2000 ADT	12	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	11	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	10	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	9	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	8	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	7	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	6	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	5	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	4	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	3	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	2	49.79	4.35	49.75	9.33			10	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	1	49.79	4.35	49.75	9.33			10	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	0	62.23	5.60	49.75	10.57			10	12.48	0.62	49.75	5.60			10	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
2000 - 6000 ADT	12	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	11	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	10	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	9	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	8	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	7	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	6	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	5	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	4	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	3	49.79	4.35	49.75	9.33			10	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	2	49.79	4.35	49.75	9.33			10	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	1	62.23	5.60	49.75	10.57			10	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	0	62.23	5.60	49.75	10.57			10	12.48	0.62	49.75	5.60			10	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
OVER 6000 ADT	12	12.48	0.62	49.75	5.60			10	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	11	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	10	24.92	1.87	49.75	6.84			10	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	9	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	8	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	7	37.36	3.11	49.75	8.09			10	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	6	49.79	4.35	49.75	9.33			10	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	5	49.79	4.35	49.75	9.33			10	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	4	62.23	5.60	49.75	10.57			10	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	3	62.23	5.60	49.75	10.57			10	12.48	0.62	49.75	5.60			10	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	2	74.67	6.84	49.75	11.82			10	12.48	0.62	49.75	5.60			10	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	1	74.67	6.84	49.75	11.82			10	12.48	0.62	49.75	5.60			10	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	0	74.67	6.84	49.75	11.82			10	12.48	0.62	49.75	5.60			10	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5

GUARDRAIL AT OBSTRUCTIONS
45 MPH DESIGN LENGTH OF NEED TABLES



W-BEAM GUARDRAIL DIMENSION LAYOUT

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
45	0.62	12.48	4.98	125.42

NOTES:

The contractor shall use wood posts for the W-beam guardrail and end terminal section.

① Does not include end terminal section.

② The width of the obstruction shall be rounded up to the nearest 12'-6" length.

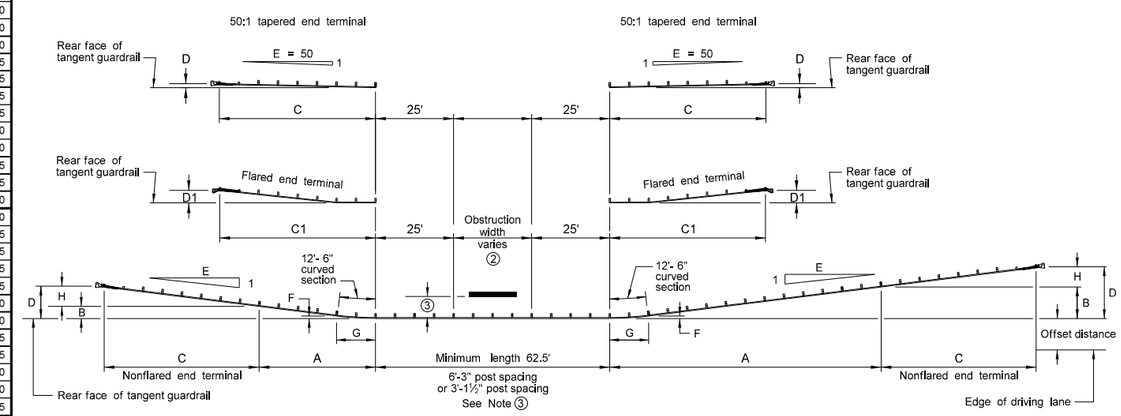
③ Where distance from rear face of W-beam railing to a fixed object is 3' or more, post spacing in this area shall be 6'-3".

Where distance from rear face of W-beam railing to a fixed object is less than 3', post spacing in this area shall be 3'-1½".

LENGTH OF NEED TABLE 50 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	APPROACH SIDE A	B	C	D	C1	D1	E	OPPOSITE SIDE A	B	C	D	C1	D1	E	TOTAL W-BEAM LENGTH ① 0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	11	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	10	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	9	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	8	12.48	0.57	49.79	5.09			11	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	7	12.48	0.57	49.79	5.09			11	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	6	12.48	0.57	49.79	5.09			11	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	5	12.48	0.57	49.79	5.09			11	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	4	24.93	1.70	49.79	6.22			11	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	3	24.93	1.70	49.79	6.22			11	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	2	37.38	2.83	49.79	7.36			11	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	1	37.38	2.83	49.79	7.36			11	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	0	49.83	3.96	49.79	8.49			11	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
750 - 1500 ADT	12	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	11	12.48	0.57	49.79	5.09			11	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	10	12.48	0.57	49.79	5.09			11	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	9	12.48	0.57	49.79	5.09			11	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	8	12.48	0.57	49.79	5.09			11	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	7	24.93	1.70	49.79	6.22			11	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	6	24.93	1.70	49.79	6.22			11	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	5	37.38	2.83	49.79	7.36			11	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	4	37.38	2.83	49.79	7.36			11	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	3	49.83	3.96	49.79	8.49			11	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	2	49.83	3.96	49.79	8.49			11	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	1	62.27	5.09	49.79	9.62			11	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	0	62.27	5.09	49.79	9.62			11	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
1500 - 2000 ADT	12	12.48	0.57	49.79	5.09			11	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	11	12.48	0.57	49.79	5.09			11	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	10	12.48	0.57	49.79	5.09			11	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	9	12.48	0.57	49.79	5.09			11	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	8	24.93	1.70	49.79	6.22			11	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	7	24.93	1.70	49.79	6.22			11	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	6	37.38	2.83	49.79	7.36			11	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	5	37.38	2.83	49.79	7.36			11	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	4	49.83	3.96	49.79	8.49			11	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	3	49.83	3.96	49.79	8.49			11	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	2	62.27	5.09	49.79	9.62			11	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	1	62.27	5.09	49.79	9.62			11	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	0	74.72	6.22	49.79	10.75			11	12.48	0.57	49.79	5.09			11	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
2000 - 6000 ADT	12	12.48	0.57	49.79	5.09			11	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	11	12.48	0.57	49.79	5.09			11	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	10	12.48	0.57	49.79	5.09			11	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	9	24.93	1.70	49.79	6.22			11	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	8	24.93	1.70	49.79	6.22			11	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	7	37.38	2.83	49.79	7.36			11	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	6	37.38	2.83	49.79	7.36			11	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	5	49.83	3.96	49.79	8.49			11	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	4	49.83	3.96	49.79	8.49			11	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	3	62.27	5.09	49.79	9.62			11	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	2	74.72	6.22	49.79	10.75			11	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	1	74.72	6.22	49.79	10.75			11	12.48	0.57	49.79	5.09			11	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	0	87.17	7.36	49.79	11.88			11	12.48	0.57	49.79	5.09			11	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
OVER 6000 ADT	12	24.93	1.70	49.79	6.22			11	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	11	37.38	2.83	49.79	7.36			11	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	10	37.38	2.83	49.79	7.36			11	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	9	49.83	3.96	49.79	8.49			11	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	8	49.83	3.96	49.79	8.49			11	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	7	62.27	5.09	49.79	9.62			11	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	6	62.27	5.09	49.79	9.62			11	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	5	74.72	6.22	49.79	10.75			11	12.48	0.57	49.79	5.09			11	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	4	74.72	6.22	49.79	10.75			11	12.48	0.57	49.79	5.09			11	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	3	87.17	7.36	49.79	11.88			11	12.48	0.57	49.79	5.09			11	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	2	87.17	7.36	49.79	11.88			11	12.48	0.57	49.79	5.09			11	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	1	99.62	8.49	49.79	13.01			11	24.93	1.70	49.79	6.22			11	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	0	99.62	8.49	49.79	13.01			11	24.93	1.70	49.79	6.22			11	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0

GUARDRAIL AT OBSTRUCTIONS
50 MPH DESIGN LENGTH OF NEED TABLES



W-BEAM GUARDRAIL DIMENSION LAYOUT

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
50	0.57	12.48	4.53	137.88

NOTES:

The contractor shall use wood posts for the W-beam guardrail and end terminal section.

① Does not include end terminal section.

② The width of the obstruction shall be rounded up to the nearest 12'-6" length.

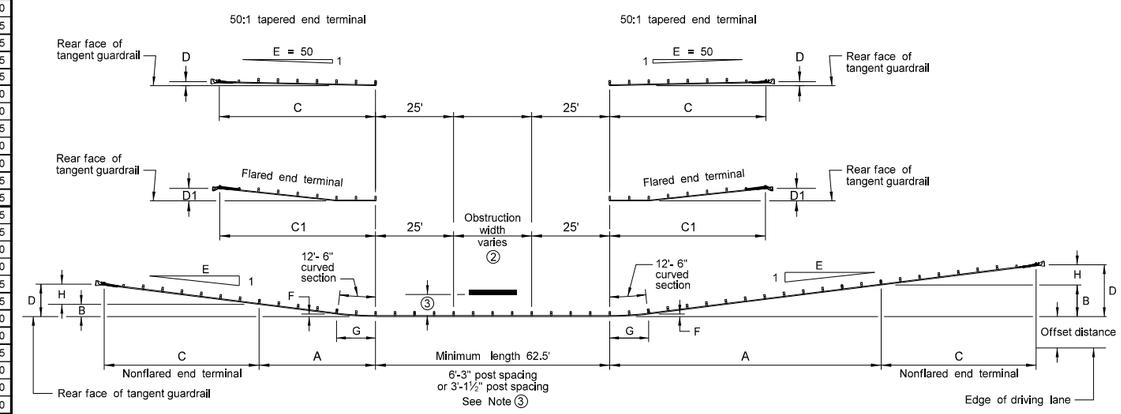
③ Where distance from rear face of W-beam railing to a fixed object is 3' or more, post spacing in this area shall be 6'-3".

Where distance from rear face of W-beam railing to a fixed object is less than 3', post spacing in this area shall be 3'-1½".

LENGTH OF NEED TABLE 55 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	APPROACH SIDE A	B	C	D	C1	D1	E	OPPOSITE SIDE A	B	C	D	C1	D1	E	TOTAL W-BEAM LENGTH (1) 0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	11	0.00	0.00	49.99	1.00	49.79	4.00	50	0.00	0.00	49.99	1.00	49.79	4.00	50	62.5	75.0	87.5	100.0	112.5	125.0	137.5	150.0
	10	12.49	0.52	49.83	4.67			12	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	9	12.49	0.52	49.83	4.67			12	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	8	12.49	0.52	49.83	4.67			12	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	7	12.49	0.52	49.83	4.67			12	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	6	24.95	1.56	49.83	5.71			12	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	5	24.95	1.56	49.83	5.71			12	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	4	37.40	2.60	49.83	6.75			12	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	3	49.86	3.63	49.83	7.79			12	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	2	49.86	3.63	49.83	7.79			12	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	1	62.32	4.67	49.83	8.82			12	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	0	62.32	4.67	49.83	8.82			12	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
750 - 1500 ADT	12	12.49	0.52	49.83	4.67			12	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	11	12.49	0.52	49.83	4.67			12	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	10	24.95	1.56	49.83	5.71			12	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	9	24.95	1.56	49.83	5.71			12	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	8	37.40	2.60	49.83	6.75			12	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	7	37.40	2.60	49.83	6.75			12	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	6	49.86	3.63	49.83	7.79			12	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	5	49.86	3.63	49.83	7.79			12	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	4	62.32	4.67	49.83	8.82			12	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	3	74.77	5.71	49.83	9.86			12	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	2	74.77	5.71	49.83	9.86			12	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	1	87.23	6.75	49.83	10.90			12	12.49	0.52	49.83	4.67			12	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	0	87.23	6.75	49.83	10.90			12	12.49	0.52	49.83	4.67			12	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
1500 - 2000 ADT	12	24.95	1.56	49.83	5.71			12	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	11	37.40	2.60	49.83	6.75			12	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	10	37.40	2.60	49.83	6.75			12	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	9	49.86	3.63	49.83	7.79			12	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	8	49.86	3.63	49.83	7.79			12	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	7	62.32	4.67	49.83	8.82			12	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	6	62.32	4.67	49.83	8.82			12	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	5	74.77	5.71	49.83	9.86			12	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	4	74.77	5.71	49.83	9.86			12	12.49	0.52	49.83	4.67			12	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	3	87.23	6.75	49.83	10.90			12	12.49	0.52	49.83	4.67			12	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	2	87.23	6.75	49.83	10.90			12	12.49	0.52	49.83	4.67			12	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	1	99.69	7.79	49.83	11.94			12	24.95	1.56	49.83	5.71			12	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	0	99.69	7.79	49.83	11.94			12	24.95	1.56	49.83	5.71			12	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
2000 - 6000 ADT	12	24.95	1.56	49.83	5.71			12	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	11	37.40	2.60	49.83	6.75			12	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	10	37.40	2.60	49.83	6.75			12	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	9	49.86	3.63	49.83	7.79			12	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	8	62.32	4.67	49.83	8.82			12	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	7	62.32	4.67	49.83	8.82			12	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	6	74.77	5.71	49.83	9.86			12	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	5	74.77	5.71	49.83	9.86			12	12.49	0.52	49.83	4.67			12	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	4	87.23	6.75	49.83	10.90			12	12.49	0.52	49.83	4.67			12	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	3	87.23	6.75	49.83	10.90			12	12.49	0.52	49.83	4.67			12	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	2	99.69	7.79	49.83	11.94			12	12.49	0.52	49.83	4.67			12	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	1	99.69	7.79	49.83	11.94			12	24.95	1.56	49.83	5.71			12	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	0	112.14	8.82	49.83	12.98			12	24.95	1.56	49.83	5.71			12	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
OVER 6000 ADT	12	37.40	2.60	49.83	6.75			12	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	11	49.86	3.63	49.83	7.79			12	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	10	49.86	3.63	49.83	7.79			12	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	9	62.32	4.67	49.83	8.82			12	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	8	62.32	4.67	49.83	8.82			12	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	7	74.77	5.71	49.83	9.86			12	12.49	0.52	49.83	4.67			12	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	6	87.23	6.75	49.83	10.90			12	12.49	0.52	49.83	4.67			12	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	5	87.23	6.75	49.83	10.90			12	12.49	0.52	49.83	4.67			12	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	4	99.69	7.79	49.83	11.94			12	12.49	0.52	49.83	4.67			12	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	3	99.69	7.79	49.83	11.94			12	24.95	1.56	49.83	5.71			12	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	2	112.14	8.82	49.83	12.98			12	24.95	1.56	49.83	5.71			12	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	1	112.14	8.82	49.83	12.98			12	37.40	2.60	49.83	6.75			12	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	0	124.60	9.86	49.83	14.01			12	37.40	2.60	49.83	6.75			12	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5

GUARDRAIL AT OBSTRUCTIONS
55 MPH DESIGN LENGTH OF NEED TABLES



W-BEAM GUARDRAIL DIMENSION LAYOUT

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
55	0.52	12.49	4.15	150.35

NOTES:

The contractor shall use wood posts for the W-beam guardrail and end terminal section.

(1) Does not include end terminal section.

(2) The width of the obstruction shall be rounded up to the nearest 12'-6" length.

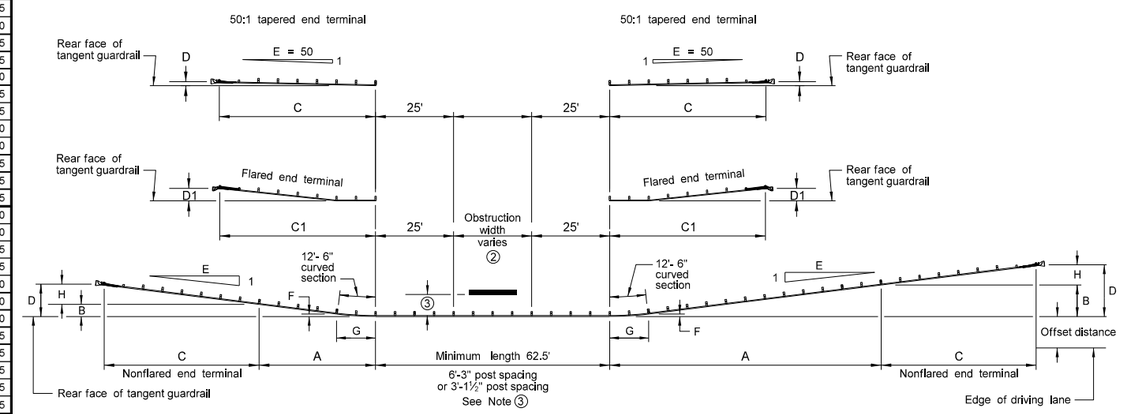
(3) Where distance from rear face of W-beam railing to a fixed object is 3' or more, post spacing in this area shall be 6'-3".

Where distance from rear face of W-beam railing to a fixed object is less than 3', post spacing in this area shall be 3'-1½".

LENGTH OF NEED TABLE 60 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	APPROACH SIDE A	B	C	D	C1	D1	E	OPPOSITE SIDE A	B	C	D	C1	D1	E	TOTAL W-BEAM LENGTH (1) 0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	12.49	0.45	49.87	4.01			14	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	11	12.49	0.45	49.87	4.01			14	0.00	0.00	49.99	1.00	49.79	4.00	50	75.0	87.5	100.0	112.5	125.0	137.5	150.0	162.5
	10	24.96	1.34	49.87	4.90			14	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	9	37.43	2.23	49.87	5.79			14	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	8	37.43	2.23	49.87	5.79			14	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	7	49.89	3.12	49.87	6.68			14	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	6	62.36	4.01	49.87	7.57			14	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	5	62.36	4.01	49.87	7.57			14	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	4	74.83	4.90	49.87	8.46			14	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	3	74.83	4.90	49.87	8.46			14	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	2	87.30	5.79	49.87	9.35			14	0.00	0.00	49.99	1.00	49.79	4.00	50	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	1	99.77	6.68	49.87	10.24			14	12.49	0.45	49.87	4.01			14	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	0	99.77	6.68	49.87	10.24			14	12.49	0.45	49.87	4.01			14	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
750 - 1500 ADT	12	49.89	3.12	49.87	6.68			14	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	11	49.89	3.12	49.87	6.68			14	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	10	62.36	4.01	49.87	7.57			14	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	9	62.36	4.01	49.87	7.57			14	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	8	74.83	4.90	49.87	8.46			14	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	7	74.83	4.90	49.87	8.46			14	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	6	87.30	5.79	49.87	9.35			14	12.49	0.45	49.87	4.01			14	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	5	99.77	6.68	49.87	10.24			14	12.49	0.45	49.87	4.01			14	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	4	99.77	6.68	49.87	10.24			14	12.49	0.45	49.87	4.01			14	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	3	112.24	7.57	49.87	11.13			14	24.96	1.34	49.87	4.90			14	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	2	112.24	7.57	49.87	11.13			14	24.96	1.34	49.87	4.90			14	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	1	124.70	8.46	49.87	12.02			14	37.43	2.23	49.87	5.79			14	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	0	124.70	8.46	49.87	12.02			14	49.89	3.12	49.87	6.68			14	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
1500 - 2000 ADT	12	74.83	4.90	49.87	8.46			14	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	11	74.83	4.90	49.87	8.46			14	12.49	0.45	49.87	4.01			14	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	10	87.30	5.79	49.87	9.35			14	12.49	0.45	49.87	4.01			14	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	9	87.30	5.79	49.87	9.35			14	12.49	0.45	49.87	4.01			14	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	8	99.77	6.68	49.87	10.24			14	24.96	1.34	49.87	4.90			14	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	7	99.77	6.68	49.87	10.24			14	24.96	1.34	49.87	4.90			14	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	6	112.24	7.57	49.87	11.13			14	37.43	2.23	49.87	5.79			14	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	5	112.24	7.57	49.87	11.13			14	37.43	2.23	49.87	5.79			14	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	4	124.70	8.46	49.87	12.02			14	49.89	3.12	49.87	6.68			14	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	3	124.70	8.46	49.87	12.02			14	49.89	3.12	49.87	6.68			14	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	2	137.17	9.35	49.87	12.91			14	62.36	4.01	49.87	7.57			14	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	1	137.17	9.35	49.87	12.91			14	62.36	4.01	49.87	7.57			14	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	0	149.64	10.24	49.87	13.80			14	74.83	4.90	49.87	8.46			14	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
2000 - 6000 ADT	12	87.30	5.79	49.87	9.35			14	12.49	0.45	49.87	4.01			14	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	11	87.30	5.79	49.87	9.35			14	12.49	0.45	49.87	4.01			14	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	10	99.77	6.68	49.87	10.24			14	12.49	0.45	49.87	4.01			14	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	9	99.77	6.68	49.87	10.24			14	24.96	1.34	49.87	4.90			14	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	8	112.24	7.57	49.87	11.13			14	24.96	1.34	49.87	4.90			14	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	7	112.24	7.57	49.87	11.13			14	37.43	2.23	49.87	5.79			14	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	6	124.70	8.46	49.87	12.02			14	37.43	2.23	49.87	5.79			14	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	5	124.70	8.46	49.87	12.02			14	49.89	3.12	49.87	6.68			14	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	4	137.17	9.35	49.87	12.91			14	49.89	3.12	49.87	6.68			14	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	3	149.64	10.24	49.87	13.80			14	62.36	4.01	49.87	7.57			14	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	2	149.64	10.24	49.87	13.80			14	62.36	4.01	49.87	7.57			14	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	1	162.11	11.13	49.87	14.69			14	74.83	4.90	49.87	8.46			14	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	0	162.11	11.13	49.87	14.69			14	87.30	5.79	49.87	9.35			14	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
OVER 6000 ADT	12	99.77	6.68	49.87	10.24			14	12.49	0.45	49.87	4.01			14	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	11	99.77	6.68	49.87	10.24			14	24.96	1.34	49.87	4.90			14	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	10	112.24	7.57	49.87	11.13			14	24.96	1.34	49.87	4.90			14	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	9	112.24	7.57	49.87	11.13			14	37.43	2.23	49.87	5.79			14	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	8	124.70	8.46	49.87	12.02			14	37.43	2.23	49.87	5.79			14	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	7	124.70	8.46	49.87	12.02			14	49.89	3.12	49.87	6.68			14	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	6	137.17	9.35	49.87	12.91			14	49.89	3.12	49.87	6.68			14	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	5	137.17	9.35	49.87	12.91			14	62.36	4.01	49.87	7.57			14	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	4	149.64	10.24	49.87	13.80			14	62.36	4.01	49.87	7.57			14	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	3	162.11	11.13	49.87	14.69			14	74.83	4.90	49.87	8.46			14	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	2	162.11	11.13	49.87	14.69			14	87.30	5.79	49.87	9.35			14	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	1	174.58	12.02	49.87	15.59			14	87.30	5.79	49.87	9.35			14	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	0	174.58	12.02	49.87	15.59			14	99.77	6.68	49.87	10.24			14	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0

GUARDRAIL AT OBSTRUCTIONS
60 MPH DESIGN LENGTH OF NEED TABLES



W-BEAM GUARDRAIL DIMENSION LAYOUT

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
60	0.45	12.49	3.56	175.30

NOTES:

The contractor shall use wood posts for the W-beam guardrail and end terminal section.

(1) Does not include end terminal section.

(2) The width of the obstruction shall be rounded up to the nearest 12'-6" length.

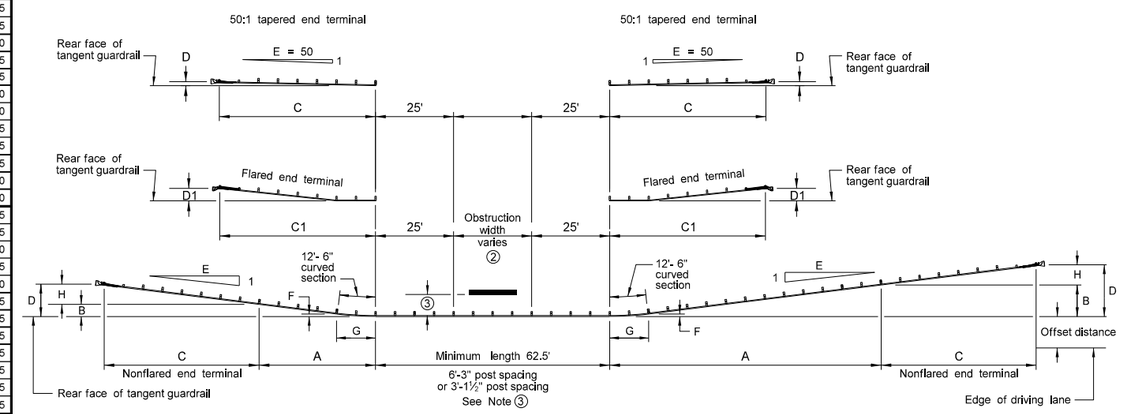
(3) Where distance from rear face of W-beam railing to a fixed object is 3' or more, post spacing in this area shall be 6'-3".

Where distance from rear face of W-beam railing to a fixed object is less than 3', post spacing in this area shall be 3'-1½".

LENGTH OF NEED TABLE 65 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	APPROACH SIDE A	B	C	D	C1	D1	E	OPPOSITE SIDE A	B	C	D	C1	D1	E	TOTAL W-BEAM LENGTH ① 0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	24.96	1.25	49.89	4.57			15	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	11	37.43	2.08	49.89	5.40			15	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	10	37.43	2.08	49.89	5.40			15	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	9	49.91	2.91	49.89	6.24			15	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	8	62.38	3.74	49.89	7.07			15	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	7	62.38	3.74	49.89	7.07			15	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	6	74.85	4.57	49.89	7.90			15	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	5	74.85	4.57	49.89	7.90			15	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	4	87.32	5.40	49.89	8.73			15	0.00	0.00	49.99	1.00	49.79	4.00	50	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	3	99.80	6.24	49.89	9.56			15	12.49	0.42	49.89	3.74			15	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	2	99.80	6.24	49.89	9.56			15	12.49	0.42	49.89	3.74			15	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	1	112.27	7.07	49.89	10.39			15	12.49	0.42	49.89	3.74			15	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	0	124.74	7.90	49.89	11.23			15	24.96	1.25	49.89	4.57			15	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
750 - 1500 ADT	12	62.38	3.74	49.89	7.07			15	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	11	62.38	3.74	49.89	7.07			15	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	10	74.85	4.57	49.89	7.90			15	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	9	87.32	5.40	49.89	8.73			15	0.00	0.00	49.99	1.00	49.79	4.00	50	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	8	87.32	5.40	49.89	8.73			15	12.49	0.42	49.89	3.74			15	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	7	99.80	6.24	49.89	9.56			15	12.49	0.42	49.89	3.74			15	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	6	99.80	6.24	49.89	9.56			15	12.49	0.42	49.89	3.74			15	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	5	112.27	7.07	49.89	10.39			15	24.96	1.25	49.89	4.57			15	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	4	124.74	7.90	49.89	11.23			15	37.43	2.08	49.89	5.40			15	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	3	124.74	7.90	49.89	11.23			15	37.43	2.08	49.89	5.40			15	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	2	137.21	8.73	49.89	12.06			15	49.91	2.91	49.89	6.24			15	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	1	137.21	8.73	49.89	12.06			15	49.91	2.91	49.89	6.24			15	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	0	149.69	9.56	49.89	12.89			15	62.38	3.74	49.89	7.07			15	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
1500 - 2000 ADT	12	87.32	5.40	49.89	8.73			15	12.49	0.42	49.89	3.74			15	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	11	99.80	6.24	49.89	9.56			15	12.49	0.42	49.89	3.74			15	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	10	99.80	6.24	49.89	9.56			15	24.96	1.25	49.89	4.57			15	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	9	112.27	7.07	49.89	10.39			15	24.96	1.25	49.89	4.57			15	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	8	112.27	7.07	49.89	10.39			15	37.43	2.08	49.89	5.40			15	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	7	124.74	7.90	49.89	11.23			15	37.43	2.08	49.89	5.40			15	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	6	124.74	7.90	49.89	11.23			15	49.91	2.91	49.89	6.24			15	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	5	137.21	8.73	49.89	12.06			15	49.91	2.91	49.89	6.24			15	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	4	137.21	8.73	49.89	12.06			15	62.38	3.74	49.89	7.07			15	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	3	149.69	9.56	49.89	12.89			15	62.38	3.74	49.89	7.07			15	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	2	149.69	9.56	49.89	12.89			15	74.85	4.57	49.89	7.90			15	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	1	162.16	10.39	49.89	13.72			15	87.32	5.40	49.89	8.73			15	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	0	162.16	10.39	49.89	13.72			15	87.32	5.40	49.89	8.73			15	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
2000 - 6000 ADT	12	99.80	6.24	49.89	9.56			15	12.49	0.42	49.89	3.74			15	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	11	112.27	7.07	49.89	10.39			15	24.96	1.25	49.89	4.57			15	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	10	112.27	7.07	49.89	10.39			15	24.96	1.25	49.89	4.57			15	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	9	124.74	7.90	49.89	11.23			15	37.43	2.08	49.89	5.40			15	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	8	124.74	7.90	49.89	11.23			15	37.43	2.08	49.89	5.40			15	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	7	137.21	8.73	49.89	12.06			15	49.91	2.91	49.89	6.24			15	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	6	137.21	8.73	49.89	12.06			15	62.38	3.74	49.89	7.07			15	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	5	149.69	9.56	49.89	12.89			15	62.38	3.74	49.89	7.07			15	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	4	149.69	9.56	49.89	12.89			15	74.85	4.57	49.89	7.90			15	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	3	162.16	10.39	49.89	13.72			15	74.85	4.57	49.89	7.90			15	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	2	174.63	11.23	49.89	14.55			15	87.32	5.40	49.89	8.73			15	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	1	174.63	11.23	49.89	14.55			15	87.32	5.40	49.89	8.73			15	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	0	187.10	12.06	49.89	15.38			15	99.80	6.24	49.89	9.56			15	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
OVER 6000 ADT	12	112.27	7.07	49.89	10.39			15	24.96	1.25	49.89	4.57			15	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	11	124.74	7.90	49.89	11.23			15	37.43	2.08	49.89	5.40			15	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	10	124.74	7.90	49.89	11.23			15	37.43	2.08	49.89	5.40			15	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	9	137.21	8.73	49.89	12.06			15	49.91	2.91	49.89	6.24			15	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	8	137.21	8.73	49.89	12.06			15	62.38	3.74	49.89	7.07			15	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	7	149.69	9.56	49.89	12.89			15	62.38	3.74	49.89	7.07			15	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	6	149.69	9.56	49.89	12.89			15	74.85	4.57	49.89	7.90			15	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	5	162.16	10.39	49.89	13.72			15	74.85	4.57	49.89	7.90			15	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	4	174.63	11.23	49.89	14.55			15	87.32	5.40	49.89	8.73			15	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	3	174.63	11.23	49.89	14.55			15	87.32	5.40	49.89	8.73			15	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	2	187.10	12.06	49.89	15.38			15	99.80	6.24	49.89	9.56			15	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	1	187.10	12.06	49.89	15.38			15	112.27	7.07	49.89	10.39			15	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	0	199.57	12.89	49.89	16.21			15	112.27	7.07	49.89	10.39			15	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5

GUARDRAIL AT OBSTRUCTIONS
65 MPH DESIGN LENGTH OF NEED TABLES



W-BEAM GUARDRAIL DIMENSION LAYOUT

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
65	0.42	12.49	3.33	187.78

NOTES:

The contractor shall use wood posts for the W-beam guardrail and end terminal section.

① Does not include end terminal section.

② The width of the obstruction shall be rounded up to the nearest 12'-6" length.

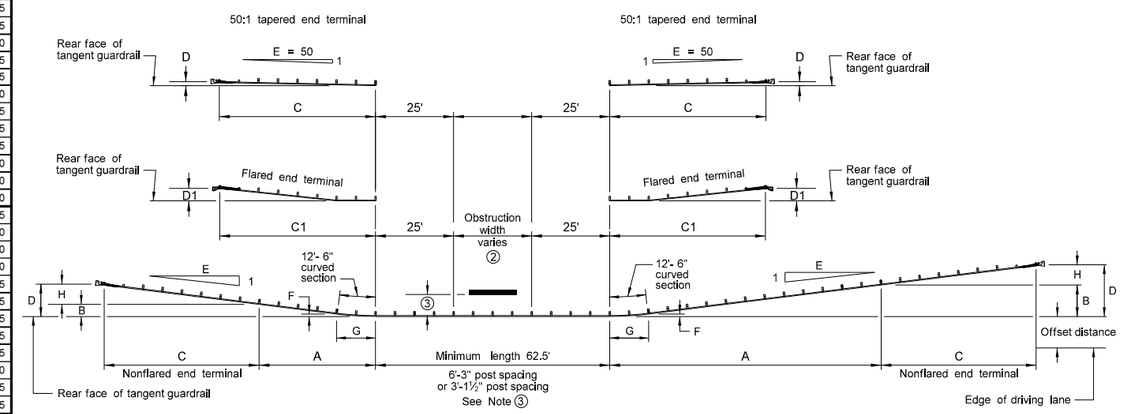
③ Where distance from rear face of W-beam railing to a fixed object is 3' or more, post spacing in this area shall be 6'-3".

Where distance from rear face of W-beam railing to a fixed object is less than 3', post spacing in this area shall be 3'-1½".

LENGTH OF NEED TABLE 70 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	APPROACH SIDE A	B	C	D	C1	D1	E	OPPOSITE SIDE A	B	C	D	C1	D1	E	TOTAL W-BEAM LENGTH ① 0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	24.96	1.25	49.89	4.57			15	0.00	0.00	49.99	1.00	49.79	4.00	50	87.5	100.0	112.5	125.0	137.5	150.0	162.5	175.0
	11	37.43	2.08	49.89	5.40			15	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	10	37.43	2.08	49.89	5.40			15	0.00	0.00	49.99	1.00	49.79	4.00	50	100.0	112.5	125.0	137.5	150.0	162.5	175.0	187.5
	9	49.91	2.91	49.89	6.24			15	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	8	62.38	3.74	49.89	7.07			15	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	7	62.38	3.74	49.89	7.07			15	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	6	74.85	4.57	49.89	7.90			15	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	5	87.32	5.40	49.89	8.73			15	0.00	0.00	49.99	1.00	49.79	4.00	50	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	4	87.32	5.40	49.89	8.73			15	0.00	0.00	49.99	1.00	49.79	4.00	50	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	3	99.80	6.24	49.89	9.56			15	12.49	0.42	49.89	3.74			15	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	2	112.27	7.07	49.89	10.39			15	12.49	0.42	49.89	3.74			15	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	1	112.27	7.07	49.89	10.39			15	12.49	0.42	49.89	3.74			15	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	0	124.74	7.90	49.89	11.23			15	24.96	1.25	49.89	4.57			15	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
750 - 1500 ADT	12	62.38	3.74	49.89	7.07			15	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	11	74.85	4.57	49.89	7.90			15	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	10	74.85	4.57	49.89	7.90			15	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	9	87.32	5.40	49.89	8.73			15	12.49	0.42	49.89	3.74			15	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	8	99.80	6.24	49.89	9.56			15	12.49	0.42	49.89	3.74			15	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	7	99.80	6.24	49.89	9.56			15	12.49	0.42	49.89	3.74			15	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	6	112.27	7.07	49.89	10.39			15	24.96	1.25	49.89	4.57			15	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	5	112.27	7.07	49.89	10.39			15	24.96	1.25	49.89	4.57			15	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	4	124.74	7.90	49.89	11.23			15	37.43	2.08	49.89	5.40			15	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	3	137.21	8.73	49.89	12.06			15	37.43	2.08	49.89	5.40			15	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	2	137.21	8.73	49.89	12.06			15	49.91	2.91	49.89	6.24			15	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	1	149.69	9.56	49.89	12.89			15	62.38	3.74	49.89	7.07			15	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	0	149.69	9.56	49.89	12.89			15	62.38	3.74	49.89	7.07			15	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
1500 - 2000 ADT	12	87.32	5.40	49.89	8.73			15	12.49	0.42	49.89	3.74			15	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	11	99.80	6.24	49.89	9.56			15	24.96	1.25	49.89	4.57			15	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	10	112.27	7.07	49.89	10.39			15	24.96	1.25	49.89	4.57			15	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	9	112.27	7.07	49.89	10.39			15	37.43	2.08	49.89	5.40			15	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	8	124.74	7.90	49.89	11.23			15	37.43	2.08	49.89	5.40			15	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	7	124.74	7.90	49.89	11.23			15	49.91	2.91	49.89	6.24			15	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	6	137.21	8.73	49.89	12.06			15	49.91	2.91	49.89	6.24			15	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	5	137.21	8.73	49.89	12.06			15	62.38	3.74	49.89	7.07			15	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	4	149.69	9.56	49.89	12.89			15	62.38	3.74	49.89	7.07			15	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	3	149.69	9.56	49.89	12.89			15	74.85	4.57	49.89	7.90			15	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	2	162.16	10.39	49.89	13.72			15	74.85	4.57	49.89	7.90			15	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	1	162.16	10.39	49.89	13.72			15	87.32	5.40	49.89	8.73			15	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	0	174.63	11.23	49.89	14.55			15	87.32	5.40	49.89	8.73			15	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
2000 - 6000 ADT	12	99.80	6.24	49.89	9.56			15	12.49	0.42	49.89	3.74			15	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	11	112.27	7.07	49.89	10.39			15	24.96	1.25	49.89	4.57			15	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	10	112.27	7.07	49.89	10.39			15	24.96	1.25	49.89	4.57			15	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	9	124.74	7.90	49.89	11.23			15	37.43	2.08	49.89	5.40			15	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	8	137.21	8.73	49.89	12.06			15	49.91	2.91	49.89	6.24			15	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	7	137.21	8.73	49.89	12.06			15	49.91	2.91	49.89	6.24			15	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	6	149.69	9.56	49.89	12.89			15	62.38	3.74	49.89	7.07			15	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	5	149.69	9.56	49.89	12.89			15	62.38	3.74	49.89	7.07			15	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	4	162.16	10.39	49.89	13.72			15	74.85	4.57	49.89	7.90			15	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	3	162.16	10.39	49.89	13.72			15	87.32	5.40	49.89	8.73			15	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	2	174.63	11.23	49.89	14.55			15	87.32	5.40	49.89	8.73			15	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	1	187.10	12.06	49.89	15.38			15	99.80	6.24	49.89	9.56			15	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	0	187.10	12.06	49.89	15.38			15	99.80	6.24	49.89	9.56			15	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
OVER 6000 ADT	12	112.27	7.07	49.89	10.39			15	37.43	2.08	49.89	5.40			15	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	11	124.74	7.90	49.89	11.23			15	37.43	2.08	49.89	5.40			15	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	10	137.21	8.73	49.89	12.06			15	49.91	2.91	49.89	6.24			15	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	9	137.21	8.73	49.89	12.06			15	49.91	2.91	49.89	6.24			15	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	8	149.69	9.56	49.89	12.89			15	62.38	3.74	49.89	7.07			15	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	7	149.69	9.56	49.89	12.89			15	62.38	3.74	49.89	7.07			15	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	6	162.16	10.39	49.89	13.72			15	74.85	4.57	49.89	7.90			15	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	5	174.63	11.23	49.89	14.55			15	87.32	5.40	49.89	8.73			15	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	4	174.63	11.23	49.89	14.55			15	87.32	5.40	49.89	8.73			15	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	3	187.10	12.06	49.89	15.38			15	99.80	6.24	49.89	9.56			15	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	2	187.10	12.06	49.89	15.38			15	99.80	6.24	49.89	9.56			15	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	1	199.57	12.89	49.89	16.21			15	112.27	7.07	49.89	10.39			15	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	0	199.57	12.89	49.89	16.21			15	112.27	7.07	49.89	10.39			15	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5

GUARDRAIL AT OBSTRUCTIONS
70 MPH DESIGN LENGTH OF NEED TABLES



W-BEAM GUARDRAIL DIMENSION LAYOUT

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
70	0.42	12.49	3.33	187.78

NOTES:

The contractor shall use wood posts for the W-beam guardrail and end terminal section.

① Does not include end terminal section.

② The width of the obstruction shall be rounded up to the nearest 12'-6" length.

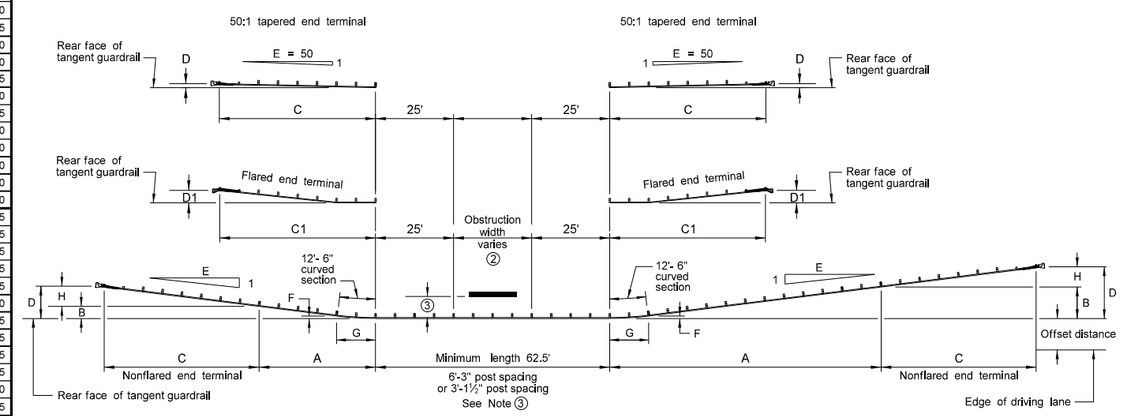
③ Where distance from rear face of W-beam railing to a fixed object is 3' or more, post spacing in this area shall be 6'-3".

Where distance from rear face of W-beam railing to a fixed object is less than 3', post spacing in this area shall be 3'-1½".

LENGTH OF NEED TABLE 75 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	APPROACH SIDE A	B	C	D	C1	D1	E	OPPOSITE SIDE A	B	C	D	C1	D1	E	TOTAL W-BEAM LENGTH ① 0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT		FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	49.92	2.73	49.90	5.85			16	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	11	49.92	2.73	49.90	5.85			16	0.00	0.00	49.99	1.00	49.79	4.00	50	112.5	125.0	137.5	150.0	162.5	175.0	187.5	200.0
	10	62.39	3.51	49.90	6.63			16	0.00	0.00	49.99	1.00	49.79	4.00	50	125.0	137.5	150.0	162.5	175.0	187.5	200.0	212.5
	9	74.87	4.29	49.90	7.41			16	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	8	74.87	4.29	49.90	7.41			16	0.00	0.00	49.99	1.00	49.79	4.00	50	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	7	87.34	5.07	49.90	8.19			16	0.00	0.00	49.99	1.00	49.79	4.00	50	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	6	99.82	5.85	49.90	8.97			16	0.00	0.00	49.99	1.00	49.79	4.00	50	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	5	99.82	5.85	49.90	8.97			16	12.49	0.39	49.90	3.51			16	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	4	112.30	6.63	49.90	9.75			16	12.49	0.39	49.90	3.51			16	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	3	124.77	7.41	49.90	10.53			16	24.97	1.17	49.90	4.29			16	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	2	124.77	7.41	49.90	10.53			16	24.97	1.17	49.90	4.29			16	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	1	137.25	8.19	49.90	11.31			16	37.44	1.95	49.90	5.07			16	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	0	149.72	8.97	49.90	12.09			16	49.92	2.73	49.90	5.85			16	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
750 - 1500 ADT	12	99.82	5.85	49.90	8.97			16	12.49	0.39	49.90	3.51			16	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	11	99.82	5.85	49.90	8.97			16	12.49	0.39	49.90	3.51			16	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	10	112.30	6.63	49.90	9.75			16	24.97	1.17	49.90	4.29			16	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	9	112.30	6.63	49.90	9.75			16	24.97	1.17	49.90	4.29			16	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	8	124.77	7.41	49.90	10.53			16	37.44	1.95	49.90	5.07			16	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	7	137.25	8.19	49.90	11.31			16	37.44	1.95	49.90	5.07			16	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	6	137.25	8.19	49.90	11.31			16	49.92	2.73	49.90	5.85			16	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	5	149.72	8.97	49.90	12.09			16	62.39	3.51	49.90	6.63			16	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	4	149.72	8.97	49.90	12.09			16	62.39	3.51	49.90	6.63			16	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	3	162.20	9.75	49.90	12.87			16	74.87	4.29	49.90	7.41			16	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	2	174.67	10.53	49.90	13.65			16	74.87	4.29	49.90	7.41			16	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	1	174.67	10.53	49.90	13.65			16	87.34	5.07	49.90	8.19			16	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	0	187.15	11.31	49.90	14.43			16	99.82	5.85	49.90	8.97			16	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
1500 - 2000 ADT	12	124.77	7.41	49.90	10.53			16	37.44	1.95	49.90	5.07			16	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	11	124.77	7.41	49.90	10.53			16	49.92	2.73	49.90	5.85			16	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	10	137.25	8.19	49.90	11.31			16	49.92	2.73	49.90	5.85			16	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	9	137.25	8.19	49.90	11.31			16	62.39	3.51	49.90	6.63			16	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	8	149.72	8.97	49.90	12.09			16	62.39	3.51	49.90	6.63			16	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	7	149.72	8.97	49.90	12.09			16	74.87	4.29	49.90	7.41			16	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	6	162.20	9.75	49.90	12.87			16	74.87	4.29	49.90	7.41			16	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	5	174.67	10.53	49.90	13.65			16	87.34	5.07	49.90	8.19			16	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	4	174.67	10.53	49.90	13.65			16	99.82	5.85	49.90	8.97			16	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	3	187.15	11.31	49.90	14.43			16	99.82	5.85	49.90	8.97			16	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	2	187.15	11.31	49.90	14.43			16	112.30	6.63	49.90	9.75			16	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	1	199.62	12.09	49.90	15.20			16	112.30	6.63	49.90	9.75			16	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	0	199.62	12.09	49.90	15.20			16	124.77	7.41	49.90	10.53			16	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
2000 - 6000 ADT	12	137.25	8.19	49.90	11.31			16	49.92	2.73	49.90	5.85			16	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	11	137.25	8.19	49.90	11.31			16	49.92	2.73	49.90	5.85			16	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	10	149.72	8.97	49.90	12.09			16	62.39	3.51	49.90	6.63			16	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	9	149.72	8.97	49.90	12.09			16	62.39	3.51	49.90	6.63			16	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	8	162.20	9.75	49.90	12.87			16	74.87	4.29	49.90	7.41			16	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	7	174.67	10.53	49.90	13.65			16	87.34	5.07	49.90	8.19			16	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	6	174.67	10.53	49.90	13.65			16	87.34	5.07	49.90	8.19			16	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	5	187.15	11.31	49.90	14.43			16	99.82	5.85	49.90	8.97			16	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	4	187.15	11.31	49.90	14.43			16	99.82	5.85	49.90	8.97			16	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	3	199.62	12.09	49.90	15.20			16	112.30	6.63	49.90	9.75			16	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	2	212.10	12.87	49.90	15.98			16	124.77	7.41	49.90	10.53			16	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	1	212.10	12.87	49.90	15.98			16	124.77	7.41	49.90	10.53			16	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	0	224.58	13.65	49.90	16.76			16	137.25	8.19	49.90	11.31			16	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
OVER 6000 ADT	12	149.72	8.97	49.90	12.09			16	62.39	3.51	49.90	6.63			16	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	11	162.20	9.75	49.90	12.87			16	74.87	4.29	49.90	7.41			16	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	10	174.67	10.53	49.90	13.65			16	87.34	5.07	49.90	8.19			16	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	9	174.67	10.53	49.90	13.65			16	87.34	5.07	49.90	8.19			16	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	8	187.15	11.31	49.90	14.43			16	99.82	5.85	49.90	8.97			16	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	7	187.15	11.31	49.90	14.43			16	99.82	5.85	49.90	8.97			16	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	6	199.62	12.09	49.90	15.20			16	112.30	6.63	49.90	9.75			16	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	5	199.62	12.09	49.90	15.20			16	112.30	6.63	49.90	9.75			16	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	4	212.10	12.87	49.90	15.98			16	124.77	7.41	49.90	10.53			16	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	3	224.58	13.65	49.90	16.76			16	137.25	8.19	49.90	11.31			16	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	2	224.58	13.65	49.90	16.76			16	137.25	8.19	49.90	11.31			16	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	1	237.05	14.43	49.90	17.54			16	149.72	8.97	49.90	12.09			16	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5
	0	237.05	14.43	49.90	17.54			16	149.72	8.97	49.90	12.09			16	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5

GUARDRAIL AT OBSTRUCTIONS
75 MPH DESIGN LENGTH OF NEED TABLES



W-BEAM GUARDRAIL DIMENSION LAYOUT

DESIGN SPEED	F	G	H	R
	FT	FT	FT	FT
75	0.39	12.49	3.12	200.26

NOTES:

The contractor shall use wood posts for the W-beam guardrail and end terminal section.

① Does not include end terminal section.

② The width of the obstruction shall be rounded up to the nearest 12'-6" length.

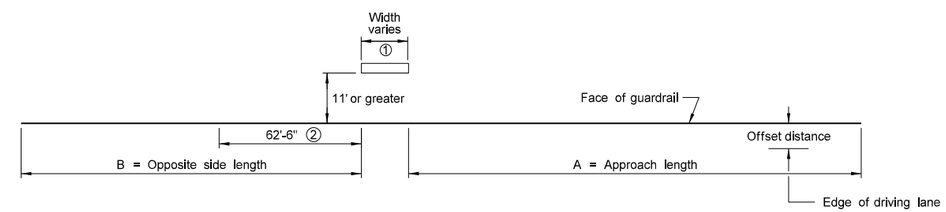
③ Where distance from rear face of W-beam railing to a fixed object is 3' or more, post spacing in this area shall be 6'-3".

Where distance from rear face of W-beam railing to a fixed object is less than 3', post spacing in this area shall be 3'-1½".

LENGTH OF NEED TABLE 40 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	TWO WAY ROADWAYS										DIVIDED HIGHWAY									
				TOTAL THREE CABLE LENGTH ①										TOTAL THREE CABLE LENGTH ①							
		A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width	A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	11	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	10	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	9	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	8	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	7	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	6	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	5	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	4	100.0	62.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5	100.0	62.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	3	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	2	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	1	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	0	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
750 - 1500 ADT	12	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	11	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	10	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	9	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	8	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	7	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	6	100.0	62.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5	100.0	62.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	5	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	4	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	3	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	2	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	1	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
1500 - 2000 ADT	12	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	11	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	10	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	9	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	8	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	7	100.0	62.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5	100.0	62.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	6	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	4	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	3	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	2	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	1	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
2000 - 6000 ADT	12	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	11	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	10	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	9	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	8	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	7	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	6	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	5	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	4	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	3	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	2	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	1	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
OVER 6000 ADT	12	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	11	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	10	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	9	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	8	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	7	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	6	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	5	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	4	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	3	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	2	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	1	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	0	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0

THREE CABLE GUARDRAIL AT OBSTRUCTIONS
40 MPH DESIGN
LENGTH OF NEED TABLES



THREE CABLE GUARDRAIL DIMENSION LAYOUT

NOTES:

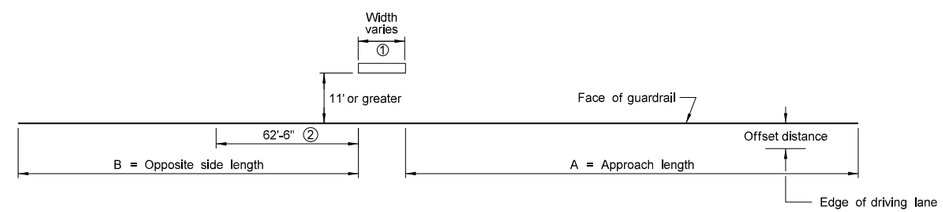
① The width of the obstruction shall be rounded up to the nearest 12'-6" length.

② The 62'-6" dimension is the minimum length beyond an obstruction that may be placed.

LENGTH OF NEED TABLE 45 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	TWO WAY ROADWAYS										DIVIDED HIGHWAY									
				TOTAL THREE CABLE LENGTH ①										TOTAL THREE CABLE LENGTH ①							
		A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width	A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	11	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	10	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	9	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	8	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	7	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	6	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	4	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	3	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	2	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	1	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
750 - 1500 ADT	12	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	11	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	10	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	9	100.0	62.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5	100.0	62.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	8	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	7	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	6	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	4	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	3	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	2	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	1	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	0	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
1500 - 2000 ADT	12	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	11	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	10	100.0	62.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5	100.0	62.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	9	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	8	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	7	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	6	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	5	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	4	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	3	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	2	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	1	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	0	225.0	75.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
2000 - 6000 ADT	12	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	11	100.0	62.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5	100.0	62.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	10	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	9	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	8	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	7	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	6	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	5	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	4	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	3	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	2	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	1	237.5	75.0	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	0	250.0	87.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
OVER 6000 ADT	12	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	11	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	10	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	9	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	8	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	7	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	6	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	5	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	4	225.0	75.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	3	225.0	87.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	2	237.5	100.0	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	1	250.0	112.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	0	262.5	125.0	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0

THREE CABLE GUARDRAIL AT OBSTRUCTIONS
45 MPH DESIGN
LENGTH OF NEED TABLES



THREE CABLE GUARDRAIL DIMENSION LAYOUT

NOTES:

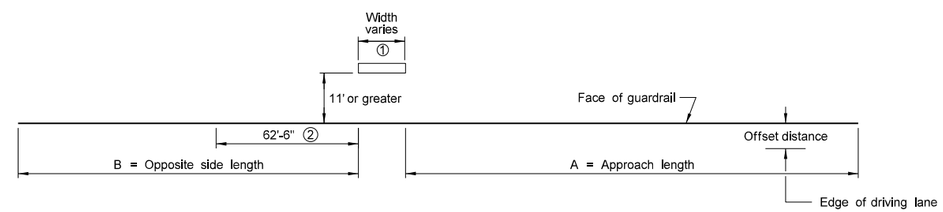
① The width of the obstruction shall be rounded up to the nearest 12'-6" length.

② The 62'-6" dimension is the minimum length beyond an obstruction that may be placed.

LENGTH OF NEED TABLE 50 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	TWO WAY ROADWAYS										DIVIDED HIGHWAY									
				TOTAL THREE CABLE LENGTH ①										TOTAL THREE CABLE LENGTH ①							
		A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width	A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	11	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	10	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	9	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	8	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	7	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	6	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	4	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	3	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	2	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	2'-2.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	1	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	0	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
750 - 1500 ADT	12	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5	75.0	62.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5
	11	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	10	100.0	62.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5	100.0	62.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	262.5
	9	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	8	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	7	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	6	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	5	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	4	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	3	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	2'-2.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	2	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	1	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	0	262.5	75.0	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
1500 - 2000 ADT	12	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	11	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	1'-2.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	10	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	9	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	8	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	7	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	6	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	5	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	4	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	2'-2.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	3	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	2	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	1	250.0	75.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	0	262.5	87.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
2000 - 6000 ADT	12	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	1'-2.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	11	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	10	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	9	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	8	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	7	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	6	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	2'-2.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	4	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	3	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	2	275.0	75.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	1	287.5	87.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	0	312.5	112.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	3'-2.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
OVER 6000 ADT	12	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	11	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	10	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	9	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	8	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	2'-2.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	7	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	6	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	5	262.5	87.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	4	275.0	100.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	3	287.5	112.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	2	312.5	125.0	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	3'-2.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	1	325.0	137.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	0	337.5	162.5	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0

THREE CABLE GUARDRAIL AT OBSTRUCTIONS
50 MPH DESIGN
LENGTH OF NEED TABLES



THREE CABLE GUARDRAIL DIMENSION LAYOUT

NOTES:

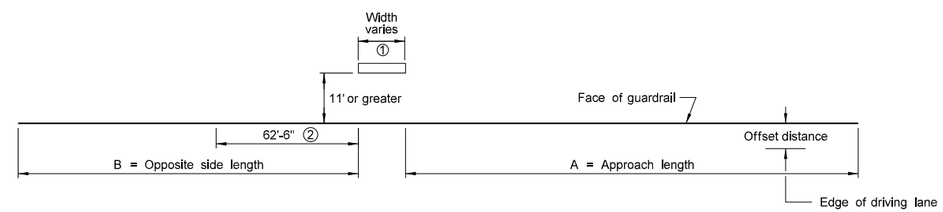
① The width of the obstruction shall be rounded up to the nearest 12'-6" length.

② The 62'-6" dimension is the minimum length beyond an obstruction that may be placed.

LENGTH OF NEED TABLE 55 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	TWO WAY ROADWAYS										DIVIDED HIGHWAY									
				TOTAL THREE CABLE LENGTH ①										TOTAL THREE CABLE LENGTH ①							
		A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width	A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	11	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	62.5	62.5	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0
	10	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0	87.5	62.5	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
	9	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	8	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	7	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	6	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	5	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	4	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	3	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	2	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	1	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	0	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
750 - 1500 ADT	12	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	11	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5	125.0	62.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	287.5
	10	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	9	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	8	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	7	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	6	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	5	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	4	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	3	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	2	287.5	75.0	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	1	300.0	100.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	0	325.0	112.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
1500 - 2000 ADT	12	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	11	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	10	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	9	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	8	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	7	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	6	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	5	250.0	75.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	4	262.5	87.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	3	275.0	112.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	2	287.5	125.0	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	1	312.5	137.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	0	325.0	150.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
2000 - 6000 ADT	12	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	11	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	10	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	9	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	8	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	7	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	6	262.5	75.0	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	5	275.0	87.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	4	287.5	100.0	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	3	300.0	112.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	2	325.0	137.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	1	337.5	150.0	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	0	350.0	162.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
OVER 6000 ADT	12	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	11	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	10	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	9	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	8	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	7	262.5	87.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	6	275.0	100.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	5	287.5	112.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	4	312.5	125.0	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	3	325.0	137.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	2	337.5	162.5	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	1	350.0	175.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	0	362.5	187.5	562.5	575.0	587.5	600.0	612.5	625.0	637.5	650.0	362.5	62.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0

THREE CABLE GUARDRAIL AT OBSTRUCTIONS
55 MPH DESIGN
LENGTH OF NEED TABLES



THREE CABLE GUARDRAIL DIMENSION LAYOUT

NOTES:

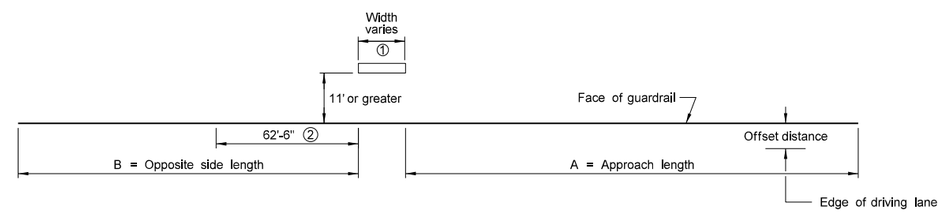
① The width of the obstruction shall be rounded up to the nearest 12'-6" length.

② The 62'-6" dimension is the minimum length beyond an obstruction that may be placed.

LENGTH OF NEED TABLE 60 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	TWO WAY ROADWAYS										DIVIDED HIGHWAY									
				TOTAL THREE CABLE LENGTH ①										TOTAL THREE CABLE LENGTH ①							
		A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width	A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0	112.5	62.5	187.5	200.0	212.5	225.0	237.5	250.0	262.5	275.0
	11	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	137.5	62.5	212.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0
	10	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	9	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	8	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	7	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	6	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	5	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	4	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	3	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	2	300.0	75.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	1	312.5	100.0	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	0	337.5	112.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
750 - 1500 ADT	12	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	11	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	10	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	9	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	8	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	7	250.0	75.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	6	262.5	87.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	5	275.0	112.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	4	300.0	125.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	3	312.5	137.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	2	325.0	150.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	1	337.5	162.5	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	0	350.0	175.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
1500 - 2000 ADT	12	212.5	75.0	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	11	225.0	87.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	10	237.5	100.0	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	9	250.0	112.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	8	262.5	125.0	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	7	275.0	137.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	6	287.5	150.0	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	5	300.0	150.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	4	300.0	162.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	3	312.5	175.0	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	2	325.0	187.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	1	337.5	200.0	550.0	562.5	575.0	587.5	600.0	612.5	625.0	637.5	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	0	350.0	212.5	575.0	587.5	600.0	612.5	625.0	637.5	650.0	662.5	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
2000 - 6000 ADT	12	250.0	87.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	11	262.5	100.0	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	10	275.0	112.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	9	287.5	125.0	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	8	300.0	137.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	7	312.5	150.0	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	6	325.0	162.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	5	337.5	175.0	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	4	350.0	187.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0	637.5	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	3	362.5	212.5	587.5	600.0	612.5	625.0	637.5	650.0	662.5	675.0	362.5	62.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0
	2	375.0	225.0	612.5	625.0	637.5	650.0	662.5	675.0	687.5	700.0	375.0	62.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5
	1	387.5	237.5	637.5	650.0	662.5	675.0	687.5	700.0	712.5	725.0	387.5	62.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0
	0	412.5	250.0	675.0	687.5	700.0	712.5	725.0	737.5	750.0	762.5	412.5	62.5	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0
OVER 6000 ADT	12	275.0	112.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	11	287.5	125.0	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	10	300.0	137.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	9	312.5	150.0	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	8	325.0	162.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	7	337.5	175.0	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	6	350.0	187.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0	637.5	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	5	362.5	200.0	575.0	587.5	600.0	612.5	625.0	637.5	650.0	662.5	362.5	62.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0
	4	375.0	225.0	612.5	625.0	637.5	650.0	662.5	675.0	687.5	700.0	375.0	62.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5
	3	387.5	237.5	637.5	650.0	662.5	675.0	687.5	700.0	712.5	725.0	387.5	62.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0
	2	400.0	250.0	662.5	675.0	687.5	700.0	712.5	725.0	737.5	750.0	400.0	62.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5
	1	412.5	262.5	687.5	700.0	712.5	725.0	737.5	750.0	762.5	775.0	412.5	62.5	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0
	0	437.5	275.0	725.0	737.5	750.0	762.5	775.0	787.5	800.0	812.5	437.5	62.5	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0

THREE CABLE GUARDRAIL AT OBSTRUCTIONS
60 MPH DESIGN
LENGTH OF NEED TABLES



THREE CABLE GUARDRAIL DIMENSION LAYOUT

NOTES:

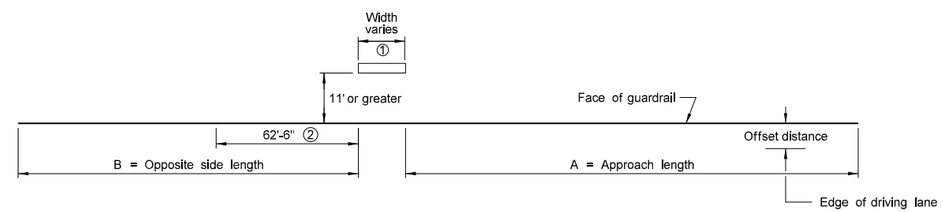
① The width of the obstruction shall be rounded up to the nearest 12'-6" length.

② The 62'-6" dimension is the minimum length beyond an obstruction that may be placed.

LENGTH OF NEED TABLE 65 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	TWO WAY ROADWAYS										DIVIDED HIGHWAY									
				TOTAL THREE CABLE LENGTH ①										TOTAL THREE CABLE LENGTH ①							
		A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width	A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	11	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	10	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5	175.0	62.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	337.5
	9	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	8	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	212.5	62.5	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
	7	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	6	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	5	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	4	287.5	75.0	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	3	300.0	87.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	2	312.5	112.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	1	337.5	125.0	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	0	350.0	150.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
750 - 1500 ADT	12	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	11	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	10	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	9	250.0	75.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	8	262.5	87.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	7	275.0	100.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	6	287.5	125.0	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	5	300.0	137.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	4	325.0	150.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	3	337.5	162.5	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	2	350.0	175.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	1	362.5	187.5	562.5	575.0	587.5	600.0	612.5	625.0	637.5	650.0	362.5	62.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0
	0	375.0	200.0	587.5	600.0	612.5	625.0	637.5	650.0	662.5	675.0	375.0	62.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5
1500 - 2000 ADT	12	237.5	100.0	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	11	250.0	112.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	10	262.5	125.0	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	9	275.0	137.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	8	287.5	150.0	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	7	300.0	162.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	6	312.5	162.5	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	5	312.5	175.0	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	4	325.0	187.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	3	337.5	200.0	550.0	562.5	575.0	587.5	600.0	612.5	625.0	637.5	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	2	350.0	212.5	575.0	587.5	600.0	612.5	625.0	637.5	650.0	662.5	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	1	362.5	225.0	600.0	612.5	625.0	637.5	650.0	662.5	675.0	687.5	362.5	62.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0
	0	375.0	237.5	625.0	637.5	650.0	662.5	675.0	687.5	700.0	712.5	375.0	62.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5
2000 - 6000 ADT	12	275.0	112.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	11	287.5	125.0	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	10	300.0	137.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	9	312.5	150.0	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	8	325.0	162.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	7	337.5	175.0	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	6	350.0	187.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0	637.5	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	5	362.5	200.0	575.0	587.5	600.0	612.5	625.0	637.5	650.0	662.5	362.5	62.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0
	4	375.0	225.0	612.5	625.0	637.5	650.0	662.5	675.0	687.5	700.0	375.0	62.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5
	3	387.5	237.5	637.5	650.0	662.5	675.0	687.5	700.0	712.5	725.0	387.5	62.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0
	2	400.0	250.0	662.5	675.0	687.5	700.0	712.5	725.0	737.5	750.0	400.0	62.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5
	1	412.5	262.5	687.5	700.0	712.5	725.0	737.5	750.0	762.5	775.0	412.5	62.5	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0
	0	437.5	275.0	725.0	737.5	750.0	762.5	775.0	787.5	800.0	812.5	437.5	62.5	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0
OVER 6000 ADT	12	300.0	137.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	11	312.5	150.0	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	10	325.0	162.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	9	337.5	175.0	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	8	350.0	187.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0	637.5	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	7	362.5	200.0	575.0	587.5	600.0	612.5	625.0	637.5	650.0	662.5	362.5	62.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0
	6	375.0	212.5	600.0	612.5	625.0	637.5	650.0	662.5	675.0	687.5	375.0	62.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5
	5	387.5	237.5	637.5	650.0	662.5	675.0	687.5	700.0	712.5	725.0	387.5	62.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0
	4	400.0	250.0	662.5	675.0	687.5	700.0	712.5	725.0	737.5	750.0	400.0	62.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5
	3	412.5	262.5	687.5	700.0	712.5	725.0	737.5	750.0	762.5	775.0	412.5	62.5	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0
	2	425.0	275.0	712.5	725.0	737.5	750.0	762.5	775.0	787.5	800.0	425.0	62.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5
	1	437.5	287.5	737.5	750.0	762.5	775.0	787.5	800.0	812.5	825.0	437.5	62.5	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0
	0	462.5	300.0	775.0	787.5	800.0	812.5	825.0	837.5	850.0	862.5	462.5	62.5	537.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0

THREE CABLE GUARDRAIL AT OBSTRUCTIONS
65 MPH DESIGN
LENGTH OF NEED TABLES



THREE CABLE GUARDRAIL DIMENSION LAYOUT

NOTES:

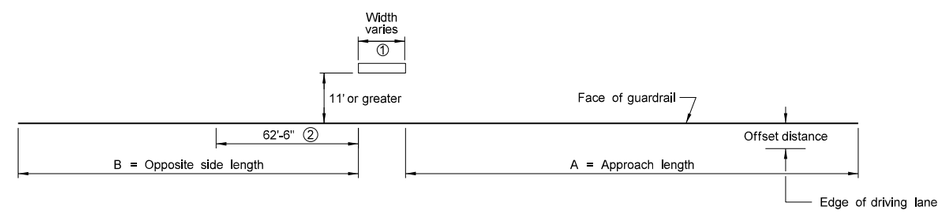
① The width of the obstruction shall be rounded up to the nearest 12'-6" length.

② The 62'-6" dimension is the minimum length beyond an obstruction that may be placed.

LENGTH OF NEED TABLE 70 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	TWO WAY ROADWAYS										DIVIDED HIGHWAY									
				TOTAL THREE CABLE LENGTH ①										TOTAL THREE CABLE LENGTH ①							
		A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width	A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5	150.0	62.5	225.0	237.5	250.0	262.5	275.0	287.5	300.0	312.5
	11	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0	162.5	62.5	237.5	250.0	262.5	275.0	287.5	300.0	312.5	325.0
	10	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	9	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	8	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	7	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	6	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	5	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	4	300.0	75.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	3	312.5	100.0	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	2	325.0	112.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	1	350.0	137.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	0	362.5	150.0	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	362.5	62.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0
750 - 1500 ADT	12	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	11	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	10	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	9	262.5	87.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	8	275.0	100.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	7	300.0	112.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	6	312.5	125.0	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	5	325.0	137.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	4	337.5	162.5	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	3	350.0	175.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	2	375.0	187.5	575.0	587.5	600.0	612.5	625.0	637.5	650.0	662.5	375.0	62.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5
	1	387.5	200.0	600.0	612.5	625.0	637.5	650.0	662.5	675.0	687.5	387.5	62.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0
	0	400.0	225.0	637.5	650.0	662.5	675.0	687.5	700.0	712.5	725.0	400.0	62.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5
1500 - 2000 ADT	12	250.0	100.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	250.0	62.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	412.5
	11	262.5	112.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	10	275.0	125.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	9	287.5	137.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	8	300.0	150.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	7	312.5	162.5	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	6	325.0	175.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	5	337.5	187.5	537.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	4	350.0	200.0	562.5	575.0	587.5	600.0	612.5	625.0	637.5	650.0	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	3	362.5	212.5	587.5	600.0	612.5	625.0	637.5	650.0	662.5	675.0	362.5	62.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0
	2	375.0	225.0	612.5	625.0	637.5	650.0	662.5	675.0	687.5	700.0	375.0	62.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5
	1	387.5	237.5	637.5	650.0	662.5	675.0	687.5	700.0	712.5	725.0	387.5	62.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0
	0	400.0	250.0	662.5	675.0	687.5	700.0	712.5	725.0	737.5	750.0	400.0	62.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5
2000 - 6000 ADT	12	287.5	112.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	11	300.0	137.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	10	312.5	150.0	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	9	325.0	162.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	8	337.5	175.0	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	7	350.0	187.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0	637.5	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	6	362.5	200.0	575.0	587.5	600.0	612.5	625.0	637.5	650.0	662.5	362.5	62.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0
	5	387.5	212.5	612.5	625.0	637.5	650.0	662.5	675.0	687.5	700.0	387.5	62.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0
	4	400.0	225.0	637.5	650.0	662.5	675.0	687.5	700.0	712.5	725.0	400.0	62.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5
	3	412.5	237.5	662.5	675.0	687.5	700.0	712.5	725.0	737.5	750.0	412.5	62.5	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0
	2	425.0	262.5	700.0	712.5	725.0	737.5	750.0	762.5	775.0	787.5	425.0	62.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5
	1	437.5	275.0	725.0	737.5	750.0	762.5	775.0	787.5	800.0	812.5	437.5	62.5	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0
	0	450.0	287.5	750.0	762.5	775.0	787.5	800.0	812.5	825.0	837.5	450.0	62.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5
OVER 6000 ADT	12	312.5	150.0	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	11	325.0	162.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	10	337.5	175.0	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	9	350.0	187.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0	637.5	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	8	375.0	200.0	587.5	600.0	612.5	625.0	637.5	650.0	662.5	675.0	375.0	62.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5
	7	387.5	212.5	612.5	625.0	637.5	650.0	662.5	675.0	687.5	700.0	387.5	62.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0
	6	400.0	225.0	637.5	650.0	662.5	675.0	687.5	700.0	712.5	725.0	400.0	62.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5
	5	412.5	250.0	675.0	687.5	700.0	712.5	725.0	737.5	750.0	762.5	412.5	62.5	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0
	4	425.0	262.5	700.0	712.5	725.0	737.5	750.0	762.5	775.0	787.5	425.0	62.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5
	3	437.5	275.0	725.0	737.5	750.0	762.5	775.0	787.5	800.0	812.5	437.5	62.5	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0
	2	450.0	287.5	750.0	762.5	775.0	787.5	800.0	812.5	825.0	837.5	450.0	62.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5
	1	462.5	300.0	775.0	787.5	800.0	812.5	825.0	837.5	850.0	862.5	462.5	62.5	537.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0
	0	487.5	312.5	812.5	825.0	837.5	850.0	862.5	875.0	887.5	900.0	487.5	62.5	562.5	575.0	587.5	600.0	612.5	625.0	637.5	650.0

THREE CABLE GUARDRAIL AT OBSTRUCTIONS
70 MPH DESIGN
LENGTH OF NEED TABLES



THREE CABLE GUARDRAIL DIMENSION LAYOUT

NOTES:

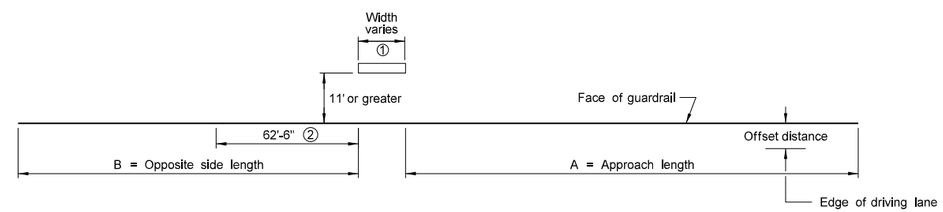
① The width of the obstruction shall be rounded up to the nearest 12'-6" length.

② The 62'-6" dimension is the minimum length beyond an obstruction that may be placed.

LENGTH OF NEED TABLE 75 MPH DESIGN SPEED

DESIGN TRAFFIC VOLUME	GUARDRAIL OFFSET DISTANCE	TWO WAY ROADWAYS										DIVIDED HIGHWAY									
				TOTAL THREE CABLE LENGTH ①										TOTAL THREE CABLE LENGTH ①							
		A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width	A	B	0' - 12.5' Obstruction width	12.5' - 25' Obstruction width	25' - 37.5' Obstruction width	37.5' - 50' Obstruction width	50' - 62.5' Obstruction width	62.5' - 75' Obstruction width	75' - 87.5' Obstruction width	87.5' - 100' Obstruction width
		FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT
Under 750 ADT	12	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	187.5	62.5	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0
	11	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5	200.0	62.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5
	10	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5	225.0	62.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0	387.5
	9	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0	237.5	62.5	312.5	325.0	337.5	350.0	362.5	375.0	387.5	400.0
	8	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	7	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	6	287.5	75.0	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	5	312.5	100.0	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	4	325.0	112.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	3	350.0	137.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	2	362.5	150.0	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	362.5	62.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0
	1	387.5	162.5	562.5	575.0	587.5	600.0	612.5	625.0	637.5	650.0	387.5	62.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0
	0	400.0	187.5	600.0	612.5	625.0	637.5	650.0	662.5	675.0	687.5	400.0	62.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5
750 - 1500 ADT	12	262.5	87.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	262.5	62.5	337.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0
	11	275.0	112.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5	275.0	62.5	350.0	362.5	375.0	387.5	400.0	412.5	425.0	437.5
	10	287.5	125.0	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	9	312.5	137.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	8	325.0	150.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	7	337.5	162.5	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	6	350.0	175.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	5	362.5	187.5	562.5	575.0	587.5	600.0	612.5	625.0	637.5	650.0	362.5	62.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0
	4	375.0	212.5	600.0	612.5	625.0	637.5	650.0	662.5	675.0	687.5	375.0	62.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5
	3	387.5	225.0	625.0	637.5	650.0	662.5	675.0	687.5	700.0	712.5	387.5	62.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0
	2	412.5	237.5	662.5	675.0	687.5	700.0	712.5	725.0	737.5	750.0	412.5	62.5	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0
	1	425.0	250.0	687.5	700.0	712.5	725.0	737.5	750.0	762.5	775.0	425.0	62.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5
	0	437.5	262.5	712.5	725.0	737.5	750.0	762.5	775.0	787.5	800.0	437.5	62.5	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0
1500 - 2000 ADT	12	287.5	150.0	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5	287.5	62.5	362.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0
	11	300.0	162.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5	300.0	62.5	375.0	387.5	400.0	412.5	425.0	437.5	450.0	462.5
	10	312.5	175.0	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5	312.5	62.5	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0
	9	325.0	187.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	8	337.5	200.0	550.0	562.5	575.0	587.5	600.0	612.5	625.0	637.5	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	7	350.0	212.5	575.0	587.5	600.0	612.5	625.0	637.5	650.0	662.5	350.0	62.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0	512.5
	6	362.5	225.0	600.0	612.5	625.0	637.5	650.0	662.5	675.0	687.5	362.5	62.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0
	5	375.0	237.5	625.0	637.5	650.0	662.5	675.0	687.5	700.0	712.5	375.0	62.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5
	4	387.5	250.0	650.0	662.5	675.0	687.5	700.0	712.5	725.0	737.5	387.5	62.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0
	3	400.0	262.5	675.0	687.5	700.0	712.5	725.0	737.5	750.0	762.5	400.0	62.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5
	2	412.5	275.0	700.0	712.5	725.0	737.5	750.0	762.5	775.0	787.5	412.5	62.5	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0
	1	425.0	275.0	712.5	725.0	737.5	750.0	762.5	775.0	787.5	800.0	425.0	62.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5
	0	437.5	287.5	737.5	750.0	762.5	775.0	787.5	800.0	812.5	825.0	437.5	62.5	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0
2000 - 6000 ADT	12	325.0	162.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5	325.0	62.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5
	11	337.5	187.5	537.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0	337.5	62.5	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
	10	362.5	200.0	575.0	587.5	600.0	612.5	625.0	637.5	650.0	662.5	362.5	62.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0
	9	375.0	212.5	600.0	612.5	625.0	637.5	650.0	662.5	675.0	687.5	375.0	62.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5
	8	387.5	225.0	625.0	637.5	650.0	662.5	675.0	687.5	700.0	712.5	387.5	62.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0
	7	400.0	237.5	650.0	662.5	675.0	687.5	700.0	712.5	725.0	737.5	400.0	62.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0	562.5
	6	412.5	250.0	675.0	687.5	700.0	712.5	725.0	737.5	750.0	762.5	412.5	62.5	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0
	5	425.0	262.5	700.0	712.5	725.0	737.5	750.0	762.5	775.0	787.5	425.0	62.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5
	4	437.5	275.0	725.0	737.5	750.0	762.5	775.0	787.5	800.0	812.5	437.5	62.5	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0
	3	450.0	287.5	750.0	762.5	775.0	787.5	800.0	812.5	825.0	837.5	450.0	62.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5
	2	462.5	300.0	775.0	787.5	800.0	812.5	825.0	837.5	850.0	862.5	462.5	62.5	537.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0
	1	475.0	312.5	800.0	812.5	825.0	837.5	850.0	862.5	875.0	887.5	475.0	62.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0	637.5
	0	487.5	325.0	825.0	837.5	850.0	862.5	875.0	887.5	900.0	912.5	487.5	62.5	562.5	575.0	587.5	600.0	612.5	625.0	637.5	650.0
OVER 6000 ADT	12	362.5	212.5	587.5	600.0	612.5	625.0	637.5	650.0	662.5	675.0	362.5	62.5	437.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0
	11	375.0	225.0	612.5	625.0	637.5	650.0	662.5	675.0	687.5	700.0	375.0	62.5	450.0	462.5	475.0	487.5	500.0	512.5	525.0	537.5
	10	387.5	237.5	637.5	650.0	662.5	675.0	687.5	700.0	712.5	725.0	387.5	62.5	462.5	475.0	487.5	500.0	512.5	525.0	537.5	550.0
	9	412.5	250.0	675.0	687.5	700.0	712.5	725.0	737.5	750.0	762.5	412.5	62.5	487.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0
	8	425.0	262.5	700.0	712.5	725.0	737.5	750.0	762.5	775.0	787.5	425.0	62.5	500.0	512.5	525.0	537.5	550.0	562.5	575.0	587.5
	7	437.5	275.0	725.0	737.5	750.0	762.5	775.0	787.5	800.0	812.5	437.5	62.5	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0
	6	450.0	287.5	750.0	762.5	775.0	787.5	800.0	812.5	825.0	837.5	450.0	62.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5
	5	462.5	300.0	775.0	787.5	800.0	812.5	825.0	837.5	850.0	862.5	462.5	62.5	537.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0
	4	475.0	312.5	800.0	812.5	825.0	837.5	850.0	862.5	875.0	887.5	475.0	62.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0	637.5
	3	487.5	325.0	825.0	837.5	850.0	862.5	875.0	887.5	900.0	912.5	487.5	62.5	562.5	575.0	587.5	600.0	612.5	625.0	637.5	650.0
	2	500.0	337.5	850.0	862.5	875.0	887.5	900.0	912.5	925.0	937.5	500.0	62.5	575.0	587.5	600.0	612.5	625.0	637.5	650.0	662.5
	1	512.5	350.0	875.0	887.5	900.0	912.5	925.0	937.5	950.0	962.5	512.5	62.5	587.5	600.0	612.5	625.0	637.5	650.0	662.5	675.0
	0	525.0	362.5	900.0	912.5	925.0	937.5	950.0	962.5	975.0	987.5	525.0	62.5	600.0	612.5	625.0	637.5	650.0	662.5	675.0	687.5

THREE CABLE GUARDRAIL AT OBSTRUCTIONS
75 MPH DESIGN
LENGTH OF NEED TABLES



THREE CABLE GUARDRAIL DIMENSION LAYOUT

NOTES:

① The width of the obstruction shall be rounded up to the nearest 12'-6" length.

② The 62'-6" dimension is the minimum length beyond an obstruction that may be placed.