T3AP 193(9) .66 135

VALUES FOR SUPERELEVATION RATES AND RUNOFF LENGTHS

D	20 M.P.H.			30 M.P.H.			40 M.P.H.			50 M.P.H.			60 M.P.H.			70 M.P.H.			80 M.P.H.		
	S.E.	T	T'	S.E.	T	T'	S.E.	T	T'	S.E.	T	T'	S.E.	T	T'	S.E.	T	T'	S.E.	T	T'
0°-15'	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	200	200	RC	240	240
0°-30'	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	175	175	.02	200	200	.02	240	240
0°-45'	NC	0	0	NC	0	0	NC	0	0	RC	150	150	.02	175	175	.03	200	200	.04	240	240
1°	NC	0	0	NC	0	0	RC	125	125	.02	150	150	.03	175	175	.04	200	200	.05	240	250
1°-30'	NC	0	0	RC	100	100	.02	125	125	.03	150	150	.04	175	175	.05	200	240	.07	240	360
2°	NC	0	0	.02	100	100	.03	125	125	.04	150	150	.05	175	210	.07	210	315	.08	260	400
2°-30'	RC	75	75	.02	100	100	.03	125	125	.05	150	180	.06	175	240	.07	210	315	.08	260	400
3°	.02	75	75	.03	100	100	.04	125	135	.05	150	180	.07	190	285	.08	240	360			
3°-30'	.02	75	75	.03	100	100	.04	125	135	.06	150	225	.07	190	285	.08	240	360			
4°	.02	75	75	.03	100	100	.05	125	165	.06	150	225	.08	220	330						
5°	.02	75	75	.04	100	120	.06	130	195	.07	170	255	.08	220	330						
6°	.02	75	75	.04	100	120	.06	130	195	.08	195	285									
7°	.02	75	75	.05	100	135	.07	150	225	.08	195	285									
8°	.02	75	75	.05	100	135	.07	150	225												
9°	.02	75	75	.06	110	165	.08	170	255												
10°	.03	75	90	.06	110	165	.08	170	255												
11°	.03	75	90	.06	110	165	.08	170	255												
12°	.03	75	90	.07	130	195	.08	170	255												
13°	.03	75	90	.07	130	195															
14°	.04	75	105	.07	130	195															
15°	.04	75	105	.07	130	195															
16°	.04	75	105	.07	130	195															
17°	.04	75	105	.08	150	225															
18°	.05	75	120	.08	150	225															
19°	.05	75	120	.08	150	225															
20°	.05	75	120	.08	150	225															
21°	.05	75	120	.08	150	225															
22°	.05	75	120	.08	150	225															
23°	.05	75	120	.08	150	225															
24°	.06	90	135																		
25°	.06	90	135																		
26°	.06	90	135																		
27°	.06	90	135																		
28°	.06	90	135																		
29°	.06	90	135																		
30°	.07	105	160																		
31°	.07	105	160																		
32°	.07	105	160																		
33°	.07	105	160																		
34°	.07	105	160																		
35°	.07	105	160																		
36°	.07	105	160																		
37°	.07	105	160																		
38°	.07	105	160																		
39°	.08	120	180																		
40°	.08	120	180																		
41°	.08	120	180																		
42°	.08	120	180																		
43°	.08	120	180																		
44°	.08	120	180																		
45°	.08	120	180																		
46°	.08	120	180																		
47°	.08	120	180																		
48°	.08	120	180																		
49°	.08	120	180																		
50°	.08	120	180																		
51°	.08	120	180																		
52°	.08	120	180																		
53°	.08	120	180																		

D*	S.E.	T	T'
D*=2°-30' (80 M.P.H.)			
D*=3°-30' (70 M.P.H.)			
D*=5°-0' (60 M.P.H.)			
D*=7°-30' (50 M.P.H.)	.08	195	285
D*=12°-30' (40 M.P.H.)	.08	170	255
D*=23°-0' (30 M.P.H.)			
D*=53°-30' (20 M.P.H.)	.08	120	180

D= DEGREE OF CURVE

D*=MAXIMUM DEGREE OF CURVE FOR GIVEN SPEED DESIGN

N.C.=NORMAL CROWN SECTION

R.C.=REMOVE ADVERSE CROWN, SUPERELEVATE AT NORMAL CROWN SLOPE.

S.E.=RATE OF SUPERELEVATION, IN FEET PER FOOT.

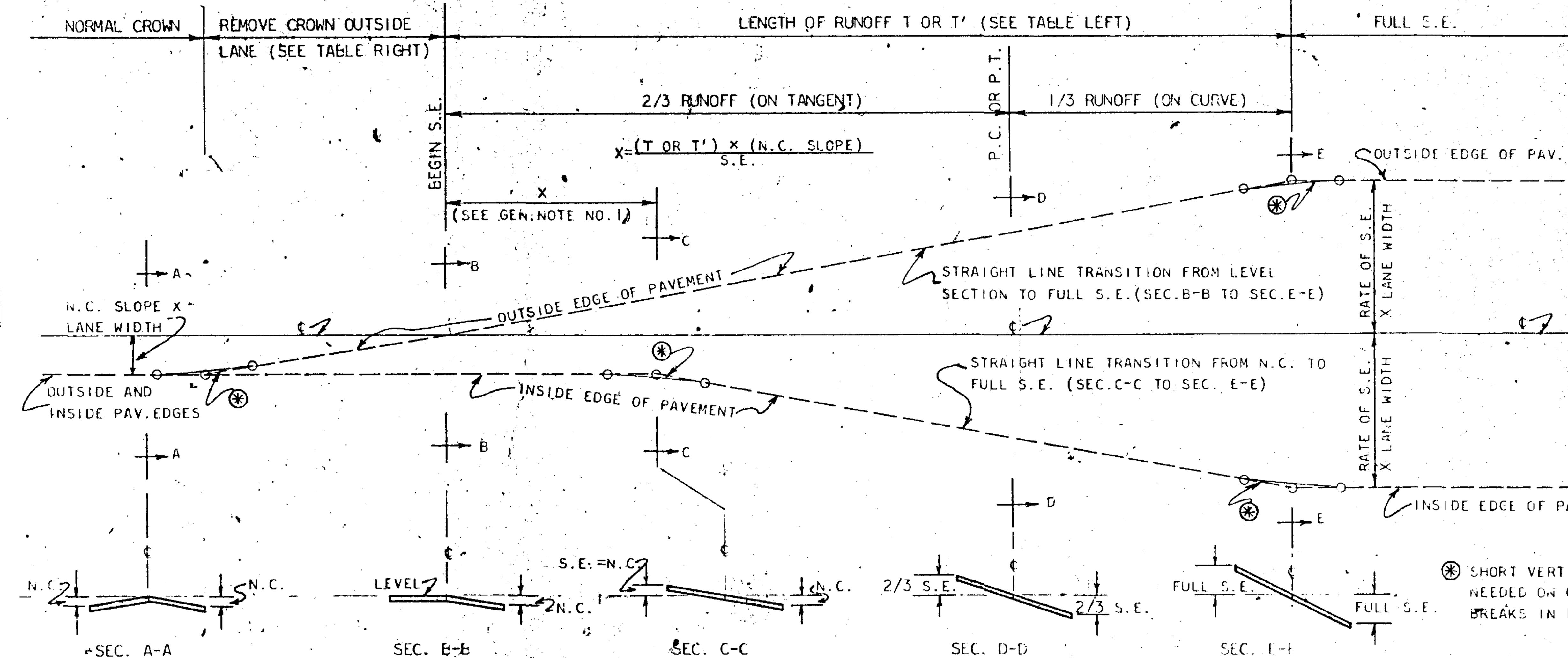
T=LENGTH OF RUNOFF IN FEET FOR TWO-LANE PAVEMENTS OR FOUR-LANE PAVEMENTS WITH MEDIANS 20 FEET OR MORE IN WIDTH.(MINIMUM)

T'=LENGTH OF RUNOFF IN FEET FOR FOUR-LANE PAVEMENTS UNDIVIDED OR WITH MEDIANS LESS THAN 20 FEET IN WIDTH (MINIMUM)

FOR 3-LANES AND 6-LANES WITH MEDIAN 20 FEET OR MORE IN WIDTH, USE RUNOFF LENGTH OF T×1.2 OR T' WHICHEVER IS LESSER

FOR 6-LANES UNDIVIDED OR WITH MEDIAN LESS THAN 20 FEET IN WIDTH, USE RUNOFF LENGTH OF T'×1.33

NOTE:
VALUES FOR T AND T' ARE BASED ON ROADWAYS WITH 12' LANES AND ARE DESIRABLE FOR ROADWAYS WITH 10' OR 11' LANES. HOWEVER, IF SHORTER LENGTHS ARE NEEDED BETWEEN REVERSE CURVES OR AT BRIDGES THE VALUES ABOVE MAY BE REDUCED BY APPROXIMATELY 8% FOR 11' LANES AND APPROXIMATELY 17% FOR 10' LANES.



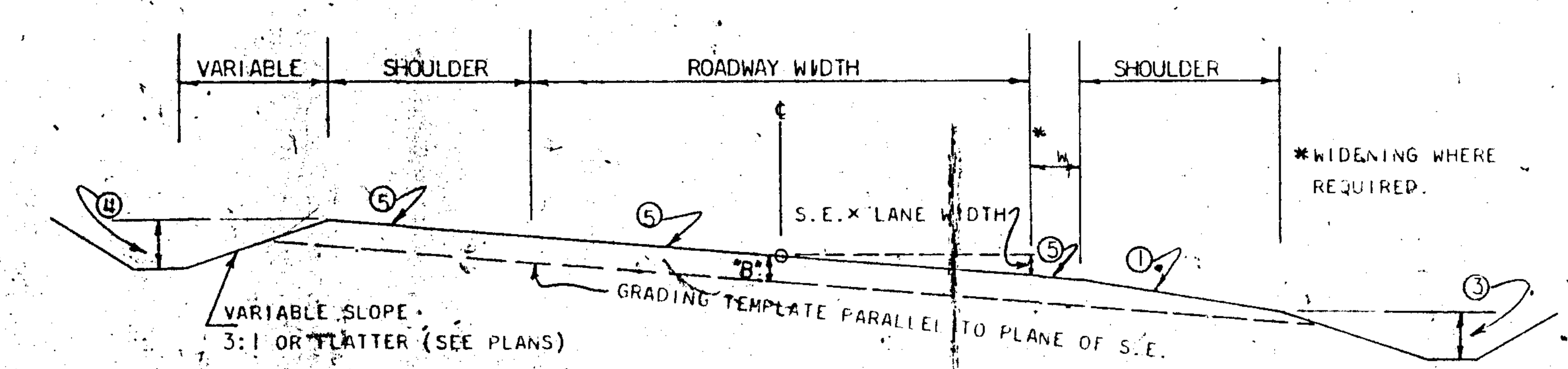
RELATIVE PROFILE DIAGRAM OF TRANSITION FROM CROWN SECTION TO FULL SUPERELEVATION

RATE OF REMOVING CROWN

LENGTH (MIN.)	M.P.H.
11' PER 1" CROWN	20
13' PER 1" CROWN	30
15' PER 1" CROWN	40
17' PER 1" CROWN	50
19' PER 1" CROWN	60
21' PER 1" CROWN	70
23' PER 1" CROWN	80

NOTE:
THE OUTSIDE SECTION OF ROADWAY SHALL BE TRANSITIONED FROM THE NORMAL CROWN SLOPE TO LEVEL SECTION BEFORE S.E. BEGINS. (SEE SEC. A-A TO SEC. B-B)

⊛ SHORT VERTICAL CURVES ARE TO BE USED WHERE NEEDED ON CONSTRUCTION TO AVOID ANGULAR BREAKS IN EDGE PROFILES.



TYPICAL SECTION OF SUPERELEVATION FOR GRADING AND FINISHED SECTIONS

① NORMAL SHOULDER SLOPE OR RATE OF S.E. WHICHEVER IS GREATER.

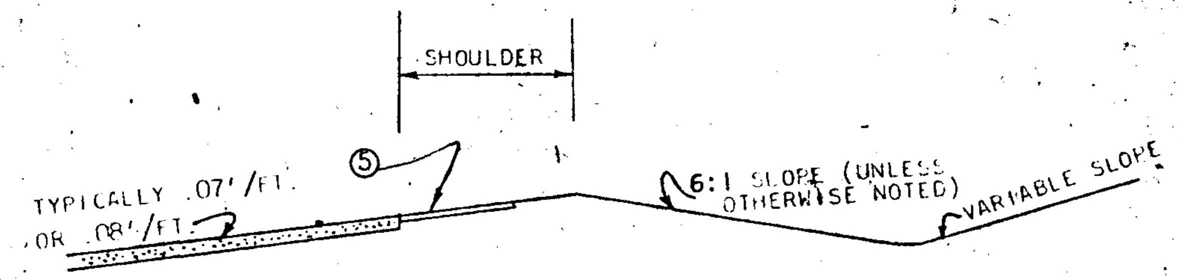
② SLOPE VARIABLE, ALGEBRAIC DIFFERENCE IN PAVING SLOPE AND SHOULDER SLOPE NOT TO EXCEED APPROXIMATELY 0.07'/FT. SEE DETAIL "A"

③ BOTTOM OF DITCH ON LOW SIDE OF CURVE TO BE MINIMUM OF 2' BELOW SHOULDER POINT UNLESS OTHERWISE NOTED.

④ BOTTOM OF DITCH ON HIGH SIDE OF CURVE TO BE A MINIMUM OF 3' BELOW SHOULDER POINT UNLESS OTHERWISE NOTED.

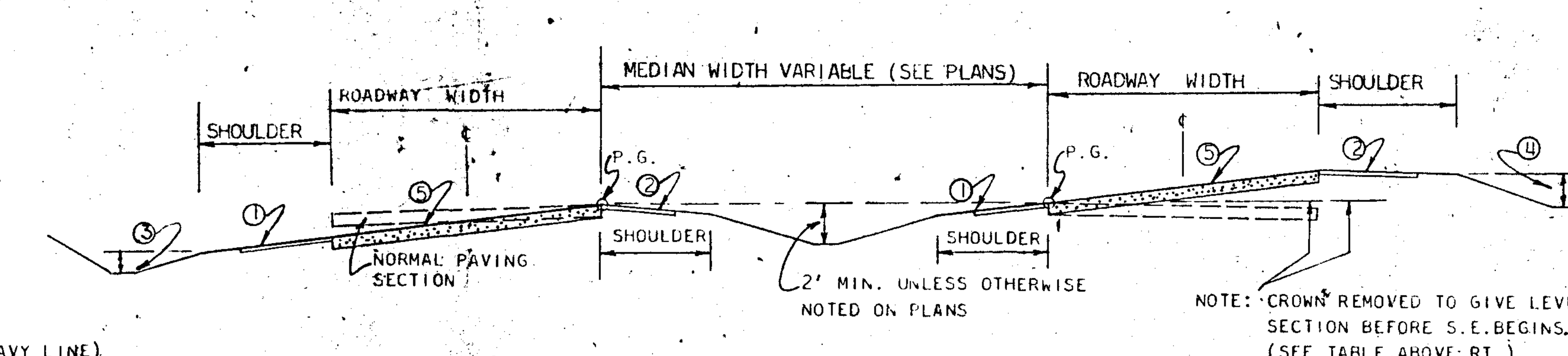
⑤ SLOPED AT RATE OF S.E.

"B"= DEPTH OF SURFACING PLUS DEPTH OF BASE AND SUB-BASE.
P.G.= PROFILE GRADE OR POINT OF ROTATION.



SHOULDER ON HIGH SIDE OF CURVE ON DIVIDED HIGHWAYS (WHERE ALBEGRAIC DIFFERENCE BETWEEN SLOPE OF S.E. AND SHOULDER SLOPED ADVERSE TO S.E. IS GREATER THAN 0.07'/FT.)

DETAIL "A"



TYPICAL SECTION OF SUPERELEVATION FOR DIVIDED HIGHWAYS

GENERAL NOTES

1. THE INSIDE SECTION OF ROADWAY WILL MAINTAIN THE NORMAL CROWN SLOPE TO A POINT (DISTANCE X, SEC. B-B TO SECTION C-C) WHERE THE OUTSIDE SECTION IS SUPERELEVATED AT THE SAME RATE.

2. UNDIVIDED HIGHWAYS:
SUPERELEVATION SHALL BE ATTAINED BY ROTATION ABOUT THE CENTERLINE, HOWEVER, IN THOSE CASES WHERE THE INSIDE OR OUTSIDE EDGE OF PAVEMENT IS ESTABLISHED AS A BASELINE AND PROFILE GRADE, THE POINT OF ROTATION MAY BE EITHER THE INSIDE OR OUTSIDE EDGE OF PAVEMENT WITH GEOMETRICS SIMILAR TO THE DIAGRAM ABOVE.

DIVIDED HIGHWAYS:
IN GENERAL, THE POINT OF ROTATION SHALL BE THE PROFILE GRADE OR INSIDE EDGES OF MEDIAN, BUT WHERE DESIRABLE, ROTATION MAY BE MADE (1) ABOUT THE CENTERLINE OF EACH ROADWAY SEPARATELY OR (2) ABOUT THE CENTERLINE OF THE MEDIAN. WHERE METHOD (2) IS USED RUNOFF LENGTH T OR T' SHALL BE INCREASED IN PROPORTION TO THE TOTAL WIDTH INCLUDING MEDIAN.

3. THE GRADING TEMPLATE IS TO BE PARALLEL TO THE PLANE OF SUPERELEVATION.

4. IN URBAN VICINITIES, AT INTERSECTIONS, RAMPS, ETC. SUPERELEVATION VALUES RUNOFF LENGTHS, AND OTHER DETAILS MAY BE MODIFIED TO MEET THE DESIRED NEEDS.

PAVEMENT WIDENING ON OPEN HIGHWAY CURVES

VALUES (IN FEET) FOR TWO-LANE ROADWAYS - ONE-WAY OR TWO-WAY TRAFFIC

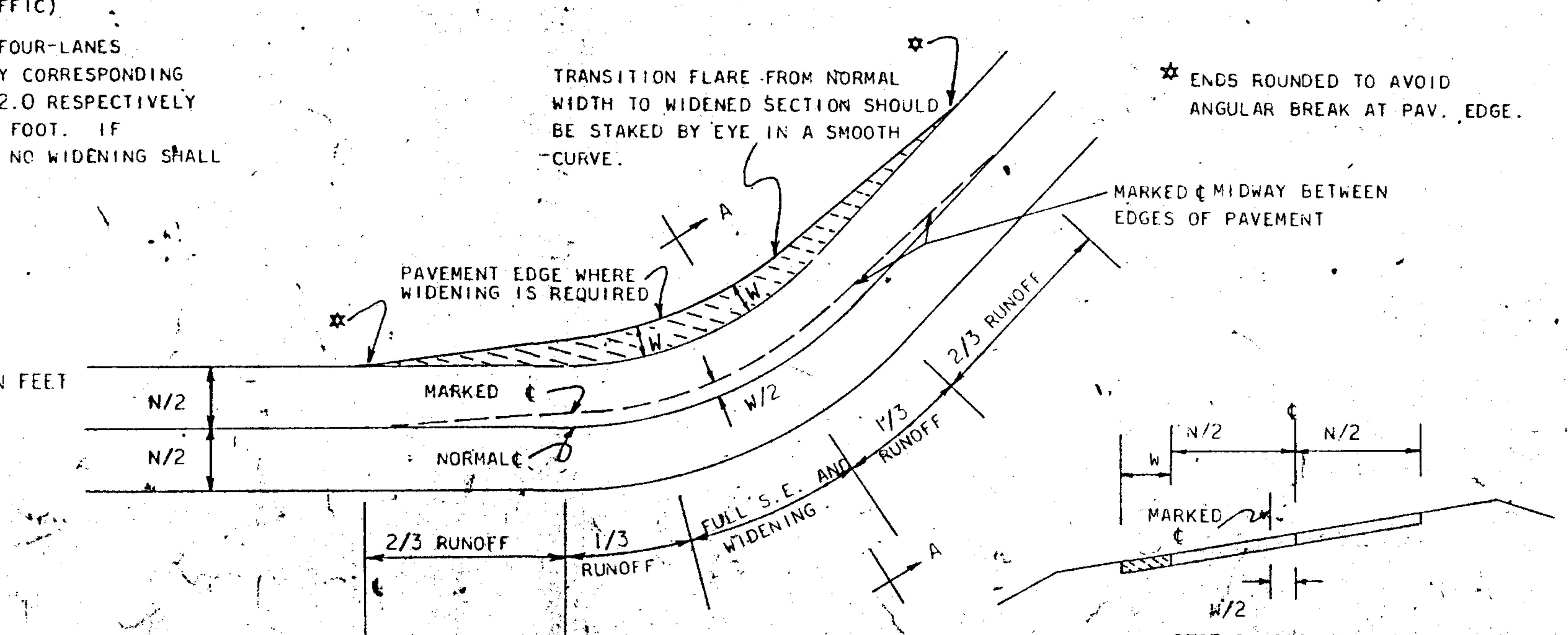
D	24 FOOT ROADWAY M.P.H. 20	30	40	50	60	70	80	22 FOOT ROADWAY M.P.H. 20	30	40	50	60	70	20 FOOT ROADWAY M.P.H. 20	30	40	50	60
0°-15' TO 0°-45'	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0
1°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	1.0	1.0	1.0	1.5	1.5	1.5	2.0
1°-30'	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	1.0	1.0	1.0	1.0	1.5	1.5	2.0	2.0
2°	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.5	1.5	1.5	2.0	2.0	2.0	2.5
2°-30'	0.0	0.0	0.0	0.0	0.5	0.5	1.0	0.5	1.0	1.0	1.0	1.5	1.5	1.5	2.0	2.0	2.0	2.5
3°	0.0	0.0	0.0	0.5	0.5	1.0		0.5	1.0	1.0	1.5	1.5	2.0	1.5	2.0	2.0	2.5	2.5
3°-30'	0.0	0.0	0.0	0.5	0.5	1.0		1.0	1.0	1.0	1.5	2.0	2.0	2.0	2.0	2.0	2.5	2.5
4°	0.0	0.0	0.5	0.5	1.0			1.0	1.0	1.5	1.5	2.0		2.0	2.0	2.5	2.5	3.0
5°	0.0	0.5	0.5	1.0	1.0			1.0	1.5	1.5	2.0	2.0		2.0	2.5	2.5	3.0	3.0
6°	0.0	0.5	1.0	1.0				1.0	1.5	2.0	2.0			2.0	2.5	3.0	3.0	
7°	0.0	0.5	1.0	1.5				1.0	1.5	2.0	2.5			2.0	2.5	3.0	3.5	
8°	0.0	1.0	1.0	1.5				1.0	2.0	2.0	2.5			2.0	3.0	3.0	3.5	
9°	0.5	1.0	1.5					1.5	2.0	2.5				2.5	3.0	3.5		
10°-11°	0.5	1.0	1.5					1.5	2.0	2.5				2.5	3.0	3.5		
12°-14°	1.0	1.5	2.0					2.0	2.5	3.0				3.0	3.5	4.0		
15°-18°	1.5	2.0						2.5	3.0					3.5	4.0			
19°-21°	2.0	2.5						3.0	3.5					4.0	4.5			
22°-25°	2.0	3.0						3.0	4.0					4.0	5.0			
26°-30°	2.5							3.5						4.5				
31°-37°	3.0							4.0						5.0				
39°-42°	3.5							4.5						5.5				
43°-48°	4.0							5.0						6.0				
49°-53°	4.5							5.5						6.5				

NOTE:
ALL VALUES LESS THAN 2' (ABOVE HEAVY LINE) ARE TO BE DISREGARDED FOR ROADWAYS TWO-LANES WIDE (ONE-WAY OR TWO-WAY TRAFFIC)

FOR ROADWAYS THREE-LANES OR FOUR-LANES (UNDIVIDED) IN WIDTH MULTIPLY CORRESPONDING VALUES IN TABLES BY 1.5 AND 2.0 RESPECTIVELY AND ROUND OFF TO NEAREST 1/2 FOOT. IF RESULTS ARE LESS THAN 2 FEET NO WIDENING SHALL BE REQUIRED.

N=NORMAL WIDTH OF ROADWAY IN FEET

W=PAVEMENT WIDENING IN FEET (2' MIN.). SEE TABLE LT.



✡ ENDS ROUNDED TO AVOID ANGULAR BREAK AT PAV. EDGE.

DETAIL "B"

R.M.U.	REV. GEN. NOTE #2	11-2-77
BY	REVISIONS	DATE

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

STANDARD

SUPERELEVATION AND WIDENING DETAILS FOR CIRCULAR CURVES

NO SCALE NOVEMBER, 1972

DESIGNED RMU
DRAWN RMU
TRACED
CHECKED JBC

SUBMITTED [signature]
APPROVED [signature]

NUMBER 9028-C

Dietzgen No. 135 "Imperial"