STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	NHS-M000-00(438)	85	

TYPICAL VALUES FOR SUPERELEVATION RATES AND RUNOFF LENGTHS

(SEE GENERAL NOTE NO. 8)

D	R (ft)	V = 30 mph			V = 40 mph			V = 50 mph			V = 55 mph			V = 60 mph			V = 65 mph			V = 70 mph		
		S.E.	L (ft) Two Lanes	L (ft) Four Lanes	S.E.	L (ft) Two Lanes	L (ft) Four Lanes	S.E.	L (ft) Two Lanes	L (ft) Four Lanes	S.E.	L (ft) Two Lanes	L (ft) Four Lanes	S.E.	L (ft) Two Lanes	L (ft) Four Lanes	S.E.	L (ft) Two Lanes	L (ft) Four Lanes	S.E.	L (ft) Two Lanes	L (ft) Four Lanes
0°-15'	22.918	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0
0°-30'	11.459	NC	0	0	NC	0	0	NC	0	0	NC	0	0	RC	175	175	RC	190	190	RC	200	200
0°-45'	7.639	NC	0	0	NC	0	0	RC	150	150	RC	160	160	.022	175	175	.025	190	190	.028	200	200
1°	5.730	NC	0	0	NC	0	0	.021	150	150	.025	160	160	.029	175	175	.032	190	190	.036	200	200
1°-30'	3.820	NC	0	0	.021	125	125	.030	150	150	.035	160	160	.041	175	175	.046	190	200	.051	200	240
2°	2.865	RC	100	100	.027	125	125	.038	150	150	.045	160	170	.051	175	210	.058	190	250	.065	200	290
2°-30'	2.292	.021	100	100	.033	125	125	.046	150	170	.053	160	200	.061	175	240	.068	190	300	.075	220	330
3°	1.910	.025	100	100	.038	125	125	.053	150	190	.060	160	230	.068	180	270	.075	210	320	.080	230	350
3°-30'	1.637	.028	100	100	.043	125	140	.058	150	210	.067	170	260	.074	200	300	.079	220	350			
4°	1.432	.031	100	100	.047	125	150	.063	150	230	.071	180	270	.078	210	310						
5°	1.146	.038	100	100	.055	125	170	.071	170	260	.078	200	300									
6°	955	.043	100	120	.062	130	190	.077	180	280												
7°	819	.048	100	130	.067	140	210	.080	190	280												
8°	716	.053	100	140	.071	150	220															
9°	637	.056	100	150	.075	160	240															
10°	573	.060	110	160	.078	160	240															
11°	521	.063	110	170	.079	170	250															
12°	477	.065	120	180	.080	170	250															
13°	441	.068	120	180																		
14°	409	.070	130	190																		
16°	358	.074	130	200																		
18°	318	.077	140	210																		
20°	286	.079	140	210																		
22°	260	.080	140	230																		
		MAX. D=22°-45'			MAX. D=12°-15'			MAX. D=7°-30'			MAX. D=6°-00'			MAX. D=4°-45'			MAX. D=3°-45'			MAX. D=3°-00'		

NOTE: SPIRALS SELDOM USED ABOVE HEAVY LINE.

T = MINIMUM LENGHT (FT) OF TRANSITIONAL RUNOFF (OR SPIRAL) FOR PAVEMENTS 2 LANES WIDE - OR FOR 4-LANE PAVEMENTS DIVIDED BY A 20 FT. OR WIDER MEDIAN WITH EACH PAVEMENT SECTION BEING 2-LANES WIDE (FOR 3-LANES MULTIPLY T BY 1.2.)

T' = MINIMUM LENGTH FT. OF TRANSITIONAL RUNOFF (OR SPIRAL) EITHER FOR 4-LANE PAVEMENTS DIVIDED BY A MEDIAN LESS THAN 20' WIDE INTO TWO 2-LANE PAVEMENTS-OR FOR 4-LANE UNDIVIDED PAVEMENTS (FOR 5-LANES & 6-LANES MULTIPLY T' BY 1 1/6 & 1 1/3 RESPECTIVELY AND ROUND OFF.)

FOR DIVIDED HIGHWAYS NOT HAVING THE SAME NUMBER OF LANES ON BOTH SIDES OF THE MEDIAN, BOTH T AND T' MAY BE UTILIZED. WHERE FUTURE ADDITION OF LANES IS ANTICIPATED TRANSITIONAL RUNOFF (OR SPIRAL) LENGTHS SHOULD BE BASED UPON THE EVENTUAL NUMBER OF LANES.

D = DEGREE OF CURVE

M.P.H. = ESTIMATED OPERATING SPEED, IN MILE PER HOUR

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

NC = NORMAL CROWN SLOPE

RC = REMOVE ADVERSE CROWN, SUPERELEVATE AT NORMAL CROWN SLOPE

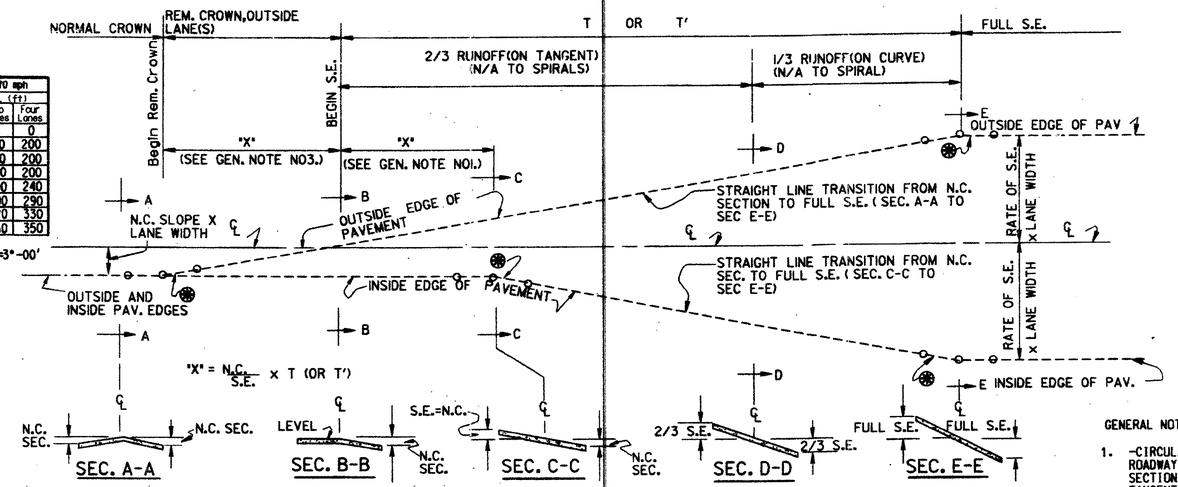
$$"X" = \frac{N.C.}{S.E.} \times T \text{ (OR T')}$$

(d) -RATE OF S.E. OR NORMAL SHOULDER SLOPE WHICHEVER IS GREATER (BUT NOT LESS THAN 3/4" PER FT. FOR UNPAVED SHOULDERS.)

(e) -ALGEBRAIC DIFFERENCE IN PAVING SLOPE AND SHOULDER SLOPE NOT OT EXCEED .08'/FT.

(f) -SLOPED AT THE RATE OF S.E.

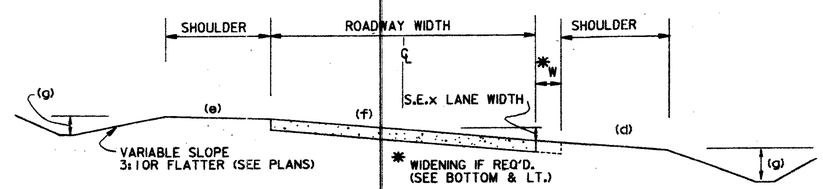
(g) -DESIRED MINIMUM DITCH DEPTHS: 2 FT. ON S.E. LOW SIDE; 3' ON HIGH SIDE.



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

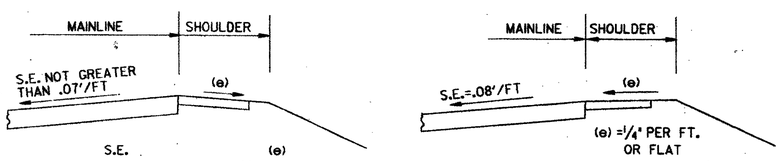
RELATIVE PROFILE DIAGRAM OF TRANSITION FROM CROWN SECTION TO FULL SUPERELEVATION

SECTION	LOCATION, IF CURVE IS CICULAR	LOCATION, IF CURVE IS SPIRAL
SEC. A-A	ON TANGENT	ON TANGENT
SEC. B-B	2/3 T RRIOR TO P.C. OR PAST P.T.	AT T.S. OR S.T.
SEC. C-C	ON TRANSITIONAL RUNOFF	ON SPIRAL TRANSITION
SEC. D-D	ON P.C. OR P.T.	ON SPIRAL TRANSITION
SEC. E-E	1/3 T PAST P.C. TO 1/3 T PRIOR TO P.T.	S.C. THRU C.S.



TYPICAL SECTION AT FULL SUPERELEVATION

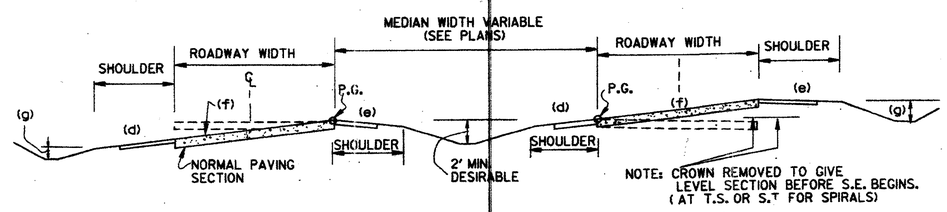
NOTE: GRADING TEMPLATES SHALL BE PARALLEL TO THE PLANE OF SUPERELEVATION



S.E.	(e)
.02'/FT. OR .03'/FT.	1/2" PER FT.
.04'/FT. OR .05'/FT.	1/4" PER FT.
.06'/FT. OR .07'/FT.	1/8" PER FT.

NOTE: THESE SECTIONS ARE APPLICABLE TO EITHER PAVED OR UNPAVED SHOULDERS, INSIDE OR OUTSIDE SHOULDERS

TYPICAL SHOULDER SECTIONS ON THE HIGH SIDE OF SUPER ELEVATION



TYPICAL SECTION OF SUPERELEVATION FOR DIVIDED HIGHWAYS

PAVEMENT WIDENING ON OPEN HIGHWAY CURVES

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

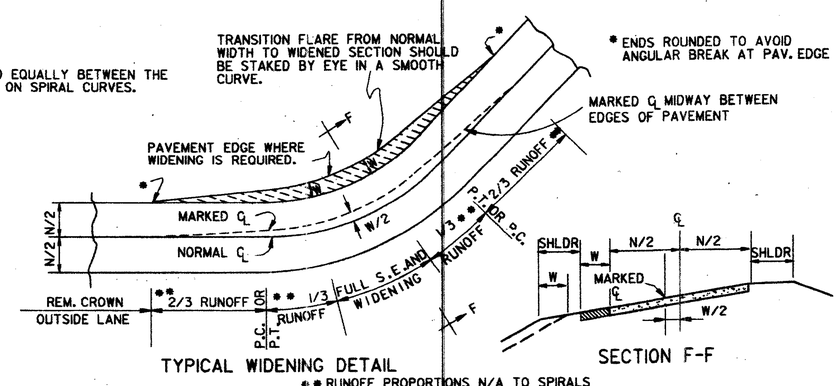
DISREGARD VALUES LESS THAN 2 FT. (ABOVE HEAVY LINE) FOR 2-LANE (ONE-WAY OR TWO-WAY TRAFFIC) PAVEMENTS. FOR 3-LANES OR 4-LANES UNDIVIDED MULTIPLY VALUES BY 1.5 & 2 RESPECTIVELY AND ROUND TO NEAREST 1/2 FOOT. IF RESULT IS LESS THAN 2 FT., DO NOT WIDEN.

D	24 FOOT ROADWAY M.P.H. 30	40	50	60	70	22 FOOT ROADWAY M.P.H. 30	40	50	60	70	20 FOOT ROADWAY M.P.H. 30	40	50	60
1°	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	1.0	1.0	1.5	1.5	1.5	2.0
2°	0.0	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
3°	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
4°	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°	0.5	0.5	1.0	1.0		1.5	1.5	2.0	2.0		2.5	2.5	2.5	3.0
6°	0.5	1.0	1.0	1.5		1.5	2.0	2.0	2.5		2.5	3.0	3.0	3.5
7°	0.5	1.0	1.5			1.5	2.0	2.5			2.5	3.0	3.5	
8°	1.0	1.0	1.5			2.0	2.0	2.5			3.0	3.0	3.5	
9°	1.0	1.5	2.0			2.0	2.5	3.0			3.0	3.5	4.0	
10°-11°	1.0	1.5				2.0	2.5				3.0	3.5		
12°-14.5°	1.5	2.0				2.5	3.0				3.5			
15°-18°	2.0					3.0					4.0			
19°-21°	2.5					3.5					4.5			
22°-25°	3.0					4.0					5.0			
26°-26.5°	3.5					4.5					5.5			

NOTE: WIDENING MAY BE DIVIDED EQUALLY BETWEEN THE INSIDE AND THE OUTSIDE ON SPIRAL CURVES.

NOTE: PAVEMENT WIDENING ON CURVES IS INTENDED FOR UTILIZATION WHERE TRUCK TRAFFIC IS SIGNIFICANT AND THE INCREASE IN PAVEMENT WIDTH IS TO BE 2 FT. OR GREATER.

LOCATIONS FOR WIDENING SHALL BE SHOWN IN THE PLANS OR SPECIFIED BY THE ENGINEER.



TYPICAL WIDENING DETAIL

** RUNOFF PROPORTIONS N/A TO SPIRALS

GENERAL NOTES:

1. -CIRCULAR CURVES: THE CROWN ON THE OUTSIDE SECTION OF ROADWAY SHALL BE REMOVED (SEC. B-B) TO GIVE LEVEL OUTSIDE SECTION PRIOR TO RUNOFF. 2/3 OF THE RUNOFF SHALL BE ON THE TANGENT. THE INSIDE SECTION OF ROADWAY SHALL MAINTAIN THE NORMAL CROWN UNTIL THE OUTSIDE SECTION IS SUPERELEVATED AT THE SAME RATE (SEC C-C). SEC. D-D IS AT THE P.C OR P.T WITH 1/3 OF RUNOFF ON THE CURVE.

   -SPIRAL CURVES: THE CROWN ON THE OUTSIDE SECTION OF ROADWAY SHALL BE REMOVED ON THE TANGENT (SEC. B-B AT THE T.S. OR S.T.) TO GIVE A LEVEL OUTSIDE SECTION. THE SUPERELEVATION RUNOFF SHALL BE EFFECTED OVER THE WHOLE OF THE TRANSITIONAL SPIRAL. THE INSIDE SECTION OF ROADWAY SHALL MAINTAIN THE NORMAL CROWN UNTIL THE OUTSIDE SECTION IS SUPERELEVATED AT THE SAME RATE. (SEC. C-C.). FULL SUPERELEVATION SHALL BE OBTAINED AT THE END OF THE TRANSITIONAL SPIRAL. (SEC. E-E IS AT THE S.C. THRU THE C.S.)

2. -UNDIVIDED HIGHWAYS: IN GENERAL, SUPERELEVATION SHALL BE ATTAINED BY ROTATION ABOUT THE CENTERLINE. HOWEVER, WHERE DESIRABLE, THE POINT OF ROTATION MAY BE EITHER THE INSIDE OR OUTSIDE EDGE OF PAVEMENT WITH SIMILAR GEOMETRICS TO THE DIAGRAM ABOVE.

   -DIVIDED HIGHWAYS: IN GENERAL, THE POINT OF ROTATION SHALL BE THE PROFILE GRADE OR INSIDE EDGES OF THE 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, THE RUNOFF LENGTH T OR T' SHALL BE INCREASED IN PROPORTION TO THE TOTAL WIDTH INCLUDING THE MEDIAN.

3. CROWN WIPEOUT LENGTH MAY BE REDUCED, IF NEEDED. (SEE NOTE 4)

4. MODIFICATIONS MAY BE MADE TO THE HERESHOWN DETAILS, S.E. RATES, TRANSITIONS, SHOULDER SLOPES, WIDENING ETC., AT INDIVIDUAL LOCATIONS PROVIDED SUCH MODIFICATIONS ARE IN ACCORDANCE WITH CURRENT AASHTO GEOMETRIC DESIGN POLICY.

5. T AND T' VALUES ARE BASED UPON 12' LANES AND ARE DESIRABLE FOR 11' & 10' LANES. HOWEVER IF SHORTER LENGTHS ARE NEEDED BETWEEN REVERSE CURVES OR AT BRIDGES, T AND T' MAY BE REDUCED BY APPROXIMATELY 8% AND 17% FOR 11' AND 10' LANES RESPECTIVELY.

6. DOWNGRADE LANES OF DIVIDED HIGHWAYS MAY BE SUPERELEVATED FOR HIGHER SPEEDS THAN UPGRADE LANES WHERE DESIRABLE.

7. CAREFUL ATTENTION SHOULD BE GIVEN TO GEOMETRICS WHERE IT IS NECESSARY TO SUPERELEVATE ON VERTICAL CURVES, AT INTERSECTIONS, ON CLOSE REVERSE CURVES, AT TURNOUTS, AT TURN LANES, ON STEEP GRADES OR WHERE OTHER POTENTIAL INTERFERING ELEMENTS ARE PRESENT.

8. THE TABULATED VALUES SHOWN AT THE TOP LEFT ARE BASED UPON A MAXIMUM SUPERELEVATION RATE OF 0.08. THE DESIGNER MAY SPECIFY SUPERELEVATION RATES AND RUNOFF LENGTHS DERIVED FROM THE A.A.S.H.T.O. DESIGN TABLES BASED UPON OTHER MAXIMUM RATES WHERE CONDITIONS WARRANT. SEE PROJECT PLANS FOR S.E. AT EACH CURVE.

DATE	11-12-97	
GEN. REVISIONS		
REVISION		
BY	RMU	

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

STANDARD

SUPERELEVATION
RATES, DETAILS, & RUNOFF LENGHTS

NO SCALE

DES. ____ (SUBMITTED) James H. Kennel
DRW. ____ STATE ROAD & AIRPORT DESIGN MGR.
TRA. ____ (APPROVED)
CHK. ____ CHIEF ENGINEER

NUMBER 9028C