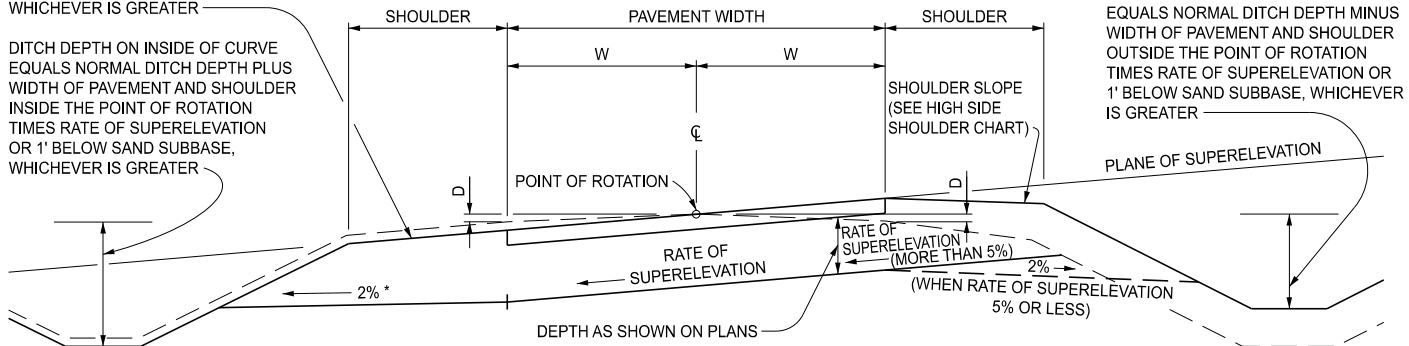


SHOULDER SLOPE EQUALS THE RATE OF SUPERELEVATION OR THE NORMAL SHOULDER SLOPE WHICHEVER IS GREATER

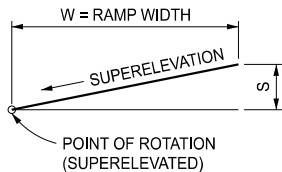
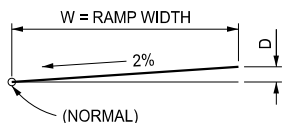
DITCH DEPTH ON INSIDE OF CURVE EQUALS NORMAL DITCH DEPTH PLUS WIDTH OF PAVEMENT AND SHOULDER INSIDE THE POINT OF ROTATION TIMES RATE OF SUPERELEVATION OR 1' BELOW SAND SUBBASE, WHICHEVER IS GREATER



* ON THE LOW SIDE OF SUPERELEVATED CURVES WHERE $e > 2\%$, MAINTAIN A MINIMUM 3" OUTER EDGE THICKNESS FOR THE LOWEST SUBLAYER (BASE OR SUBBASE). WHERE THE LOWEST SUBLAYER THICKNESS DROPS BELOW 3 INCHES, ADJUST THE SUBGRADE SLOPE OR LAYER CONFIGURATION TO MAINTAIN A 3" EDGE THICKNESS.

NOTE: ENSURE SUBGRADE DRAINAGE IS AS SHOWN ON TYPICAL CROSS SECTIONS.

SUPERELEVATED FINISHED SECTION (TWO-WAY SHOWN)



RAMPS

LEGEND

- NC = NORMAL CROWN RATE
- W = DISTANCE IN FEET FROM POINT OF ROTATION TO FARTHEST OUTSIDE EDGE (DOES NOT INCLUDE AUXILIARY LANE WIDTHS OR THE EXTRA 2' IN A 14' WIDE CONCRETE FREEWAY LANE)
- e = RATE OF SUPERELEVATION
- $S = W \times e$
- C = CROWN RUNOUT / TANGENT RUNOUT (ADVERSE CROWN REMOVED)
- L = TRANSITION LENGTH OR SUPERELEVATION RUNOFF OF INSIDE OR OUTSIDE EDGE OF PAVEMENT
- $\Delta\%$ = SUPERELEVATION TRANSITION SLOPE OF PAVEMENT EDGES

HIGH SIDE SHOULDER CHART

WHEN RATE OF FULL SUPERELEVATION IS	SHOULDER SLOPE AT FULL SUPERELEVATION EQUALS
FROM 2% TO 3%	RATE OF SUPERELEVATION MINUS NORMAL SHOULDER SLOPE
3% TO AND INCLUDING 5%	
OVER 5%	

NOTES:

THE CROWN POINT AND POINT OF ROTATION WILL NORMALLY BE AT THE CENTER OF TWO-LANE AND FOUR-LANE UNDIVIDED PAVEMENTS AND AT THE EDGE OF AN INSIDE LANE OF FIVE-LANE UNDIVIDED PAVEMENTS. THE POINT OF ROTATION WILL NORMALLY BE AT THE INSIDE EDGES OF DIVIDED PAVEMENTS.

REMOVE THE CROWN IN SUPERELEVATED SECTIONS.

ON URBAN SERVICE ROADS AND URBAN FREE ACCESS TRUNKLINE CURVES WHERE DRIVEWAYS ARE PREVALENT, AND WHERE NORMAL SUPERELEVATION CANNOT BE OBTAINED, A MINIMUM OF 1.5% TO 2% SUPERELEVATION IN THE DIRECTION OF THE CURVE MAY BE USED TO REMOVE THE ADVERSE CROWN.

DESIGN MODIFICATION OF TRANSITIONS, POINT OF ROTATION, AND CROWNS MAY BE NECESSARY TO IMPROVE RIDE QUALITY AND APPEARANCE.

THE LOCATION, LENGTH OF SUPERELEVATION TRANSITIONS, CROWN RUNOFF LENGTHS, SUPERELEVATION RATES, AND POINT OF ROTATION WILL BE AS SPECIFIED ON THE PLANS.

SPIRAL LENGTHS WILL BE EQUAL TO OR LONGER THAN TRANSITION SLOPE LENGTHS.

USE SPIRAL TRANSITIONS ON NEW ALIGNMENTS, BASED ON THE DESIGN SPEED OF THE CURVE AND THE RADIUS AS SHOWN IN THE TABLE. THE TABLE GIVES THE MAXIMUM RADIUS IN WHICH A SPIRAL SHOULD BE USED.

BEGIN THE HIGH SIDE SHOULDER TRANSITION AT THE PAVEMENT CROWN RUN OUT POINT (CROWN REMOVED). TRANSITION THE SHOULDER OVER THE DISTANCE "L" (AS CALCULATED FOR THE SUPERELEVATION TRANSITION) TO THE SHOULDER SLOPE RATE REQUIRED AT FULL PAVEMENT SUPERELEVATION. FOR RAMPS WITH SAME DIRECTION CROWN, USE THE ACTUAL "L" DISTANCE FOR THE SHOULDER CROSS SLOPE TRANSITION.

IF THE RATE OF FULL PAVEMENT SUPERELEVATION IS GREATER THAN THE NORMAL SHOULDER SLOPE, BEGIN THE LOW SIDE SHOULDER TRANSITION WHEN THE PAVEMENT REACHES THE SAME PLANE AND SLOPE RATE AS THE NORMAL SHOULDER.

WHEN TRANSITIONING THE SHOULDER SLOPE TO/FROM A BRIDGE SECTION, CALCULATE THE TRANSITION DISTANCE USING THE SUPERELEVATION TRANSITION SLOPE ($\Delta\%$) REQUIRED FOR THE CURVE, OR IN TANGENT SECTIONS, USE THE MINIMUM VALUE FOR SUPERELEVATION TRANSITION SLOPE ($\Delta\%$) GIVEN IN THE TABLE, IN THE COLUMN FOR THE SPEED OF THE ROADWAY. (TRANSITION DISTANCE = SHOULDER WIDTH $\times$ (RATE OF BRIDGE SHOULDER SUPERELEVATION MINUS RATE OF ROAD SHOULDER SUPERELEVATION) $\times 100 / \Delta\%$)

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR SUPERELEVATION AND PAVEMENT CROWNS

(SPECIAL DETAIL)
FHWA APPROVAL

07/20/2026
PLAN DATE

R-107-I

SHEET
1 OF 7

RATE OF SUPERELEVATION AND SUPERELEVATION TRANSITION SLOPE

RADIUS (FEET)	30 MPH		35 MPH		40 MPH		45 MPH		50 MPH		55 MPH		60 MPH		65 MPH		FREEWAYS				URBAN FREEWAYS AND URBAN RAMPS	
																	70 MPH		75 MPH		60 MPH	
	e%	Δ%	e%	Δ%	e%	Δ%	e%	Δ%	e%	Δ%	e%	Δ%	e%	Δ%	e%	Δ%	e%	Δ%	e%	Δ%	e%	Δ%
23000	NC	—	NC	----	NC	—	NC	----	NC	----	NC	—	NC	----	NC	—	NC	----	NC	----	NC	—
20000	NC	—	NC	----	NC	—	NC	----	NC	----	NC	—	NC	----	NC	—	NC	----	NC	----	NC	—
17000	NC	—	NC	----	NC	—	NC	----	NC	----	NC	—	NC	----	NC	—	NC	----	NC	----	NC	—
14000	NC	—	NC	----	NC	—	NC	----	NC	----	NC	—	NC	----	NC	—	2.0	0.31	2.0	0.30	NC	—
12000	NC	—	NC	----	NC	—	NC	----	NC	----	NC	—	NC	----	2.0	0.32	2.0	0.31	2.0	0.30	NC	—
10000	NC	—	NC	----	NC	—	NC	----	NC	----	NC	—	2.0	0.36	2.0	0.32	2.1	0.31	2.3	0.31	2.0	0.34
8000	NC	—	NC	----	NC	—	NC	----	2.0	0.40	2.0	0.38	2.1	0.36	2.3	0.33	2.6	0.32	2.9	0.31	2.0	0.34
6000	NC	—	NC	----	NC	—	2.0	0.40	2.0	0.40	2.3	0.39	2.7	0.37	3.0	0.34	3.3	0.33	3.7	0.33	2.4	0.36
5000	NC	—	NC	----	2.0	0.40	2.0	0.40	2.3	0.41	2.7	0.39	3.1	0.38	3.5	0.35	3.9	0.34	4.4	0.34	2.8	0.37
4000	NC	—	2.0	0.45	2.0	0.40	2.4	0.41	2.8	0.42	3.3	0.40	3.8	0.39	4.2	0.37	4.7	0.36	5.3	0.35	3.3	0.39
3500	NC	—	2.0	0.45	2.2	0.41	2.6	0.42	3.1	0.42	3.6	0.41	4.2	0.40	4.7	0.38	5.2	0.37	5.9	0.36	3.5	0.40
3000	2.0	0.50	2.0	0.45	2.5	0.42	3.0	0.43	3.5	0.43	4.1	0.42	4.7	0.41	5.2	0.39	5.9	0.38	6.5	0.37	3.8	0.41
2500	2.0	0.50	2.4	0.46	2.9	0.43	3.5	0.44	4.1	0.44	4.7	0.43	5.3	0.42	5.9	0.41	6.5	0.39	7.0	0.38	4.2	0.42
2000	2.3	0.51	2.9	0.48	3.5	0.45	4.1	0.46	4.7	0.45	5.4	0.44	6.1	0.43	6.6	0.42	7.0	0.40	R MIN = 2344'		4.6	0.44
1800	2.5	0.52	3.1	0.49	3.8	0.46	4.4	0.47	5.1	0.46	5.7	0.45	6.4	0.44	6.9	0.43	R MIN = 1922'				4.8	0.44
1600	2.7	0.52	3.4	0.50	4.1	0.48	4.8	0.48	5.4	0.47	6.1	0.45	6.7	0.44	7.0	0.43					4.9	0.45
1400	3.0	0.53	3.7	0.51	4.5	0.49	5.1	0.49	5.8	0.48	6.5	0.46	6.9	0.45	R MIN = 1565'						R MIN = 1412'	
1200	3.4	0.54	4.1	0.52	4.9	0.50	5.6	0.50	6.3	0.49	6.8	0.47	R MIN = 1263'									
1150	3.5	0.55	4.3	0.53	5.0	0.51	5.7	0.50	6.4	0.49	6.9	0.47										
1000	3.8	0.56	4.6	0.54	5.4	0.52	6.1	0.52	6.7	0.49	R MIN = 1008'											
900	4.1	0.57	4.8	0.55	5.7	0.53	6.4	0.52	6.9	0.50												
820	4.3	0.57	5.1	0.55	5.9	0.54	6.6	0.53	7.0	0.50												
800	4.4	0.58	5.1	0.56	6.0	0.54	6.7	0.53	7.0	0.50												
720	4.6	0.58	5.4	0.57	6.3	0.55	6.9	0.54	R MIN = 794'													
700	4.7	0.59	5.5	0.57	6.3	0.56	6.9	0.54														
600	5.0	0.60	5.9	0.58	6.7	0.57	R MIN = 614'															
500	5.4	0.61	6.4	0.60	7.0	0.58																
450	5.7	0.62	6.6	0.61	R MIN = 464'																	
400	6.0	0.63	6.8	0.61																		
350	6.3	0.64	7.0	0.62																		
300	6.7	0.65	R MIN = 327'																			
265	6.9	0.66																				
225	7.0	0.66																				
	R MIN = 222'																					

NOTES:

USE A 7% RATE OF SUPERELEVATION FOR LOOP RAMPS

LIMIT THE RATE OF SUPERELEVATION FOR CURVES APPROACHING RAMP TERMINALS (STOPPING CONDITION) TO 5% MAX.

IF DELTA VALUES FROM THE CHART CANNOT BE OBTAINED FOR THE DESIGN RADIUS, USE THE MAXIMUM DELTA VALUE FOR THE CORRESPONDING SPEED.

FOR RADII LESS THAN THOSE TABULATED, (BUT NOT LESS THAN R MIN.), USE e_{max} . MAXIMUM SUPERELEVATION FOR URBAN FREEWAYS AND URBAN RAMPS (WITH A 60 MPH DESIGN SPEED) IS 5%, OTHERWISE e_{max} = 7% .



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR SUPERELEVATION AND PAVEMENT CROWNS

(SPECIAL DETAIL)
FHWA APPROVAL

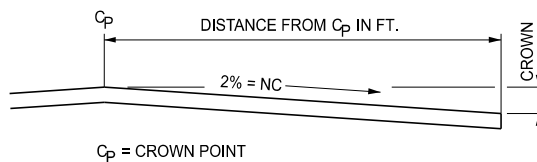
07/20/2026
PLAN DATE

R-107-I

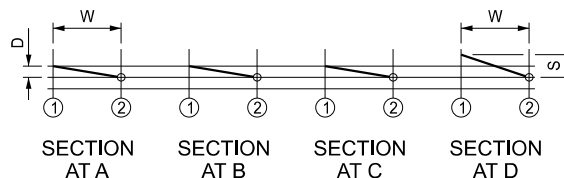
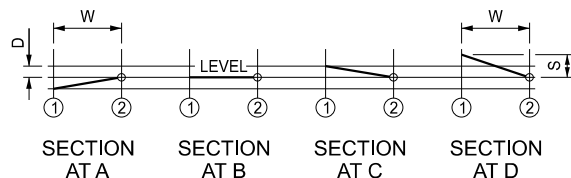
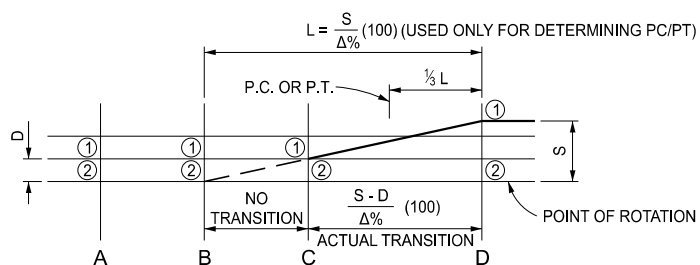
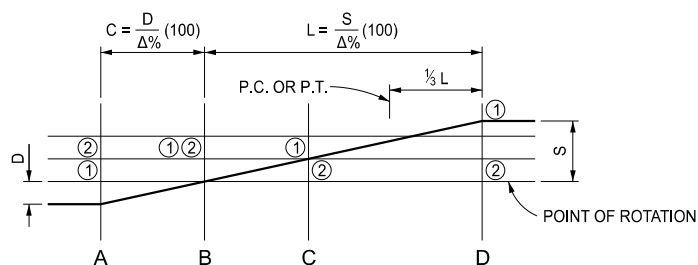
SHEET
2 OF 7

ABBREVIATIONS FOR
SPIRALED RAMP AND ROADWAYS:

T.S. = TANGENT TO SPIRAL
S.T. = SPIRAL TO TANGENT
C.S. = CURVE TO SPIRAL
S.C. = SPIRAL TO CURVE

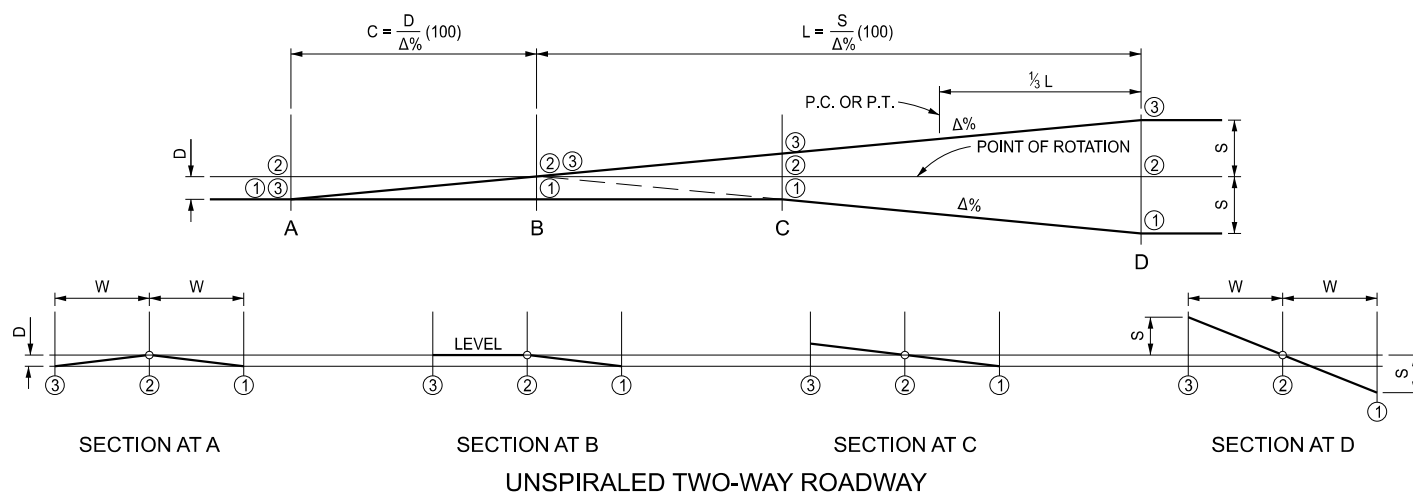


SPIRAL CURVE TRANSITIONS			
DESIGN SPEED (MPH)	MAXIMUM RADIUS (FEET)	DESIGN SPEED (MPH)	MAXIMUM RADIUS (FEET)
30	456	60	1822
35	620	65	2138
40	810	70	2479
45	1025	75	2846
50	1265	80	3238
55	1531		



UNSPIRALED RAMP (CROWN ADVERSE TO SUPER)

UNSPIRALED RAMP (CROWN SAME DIRECTION AS SUPER)



UNSPIRALED TWO-WAY ROADWAY



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

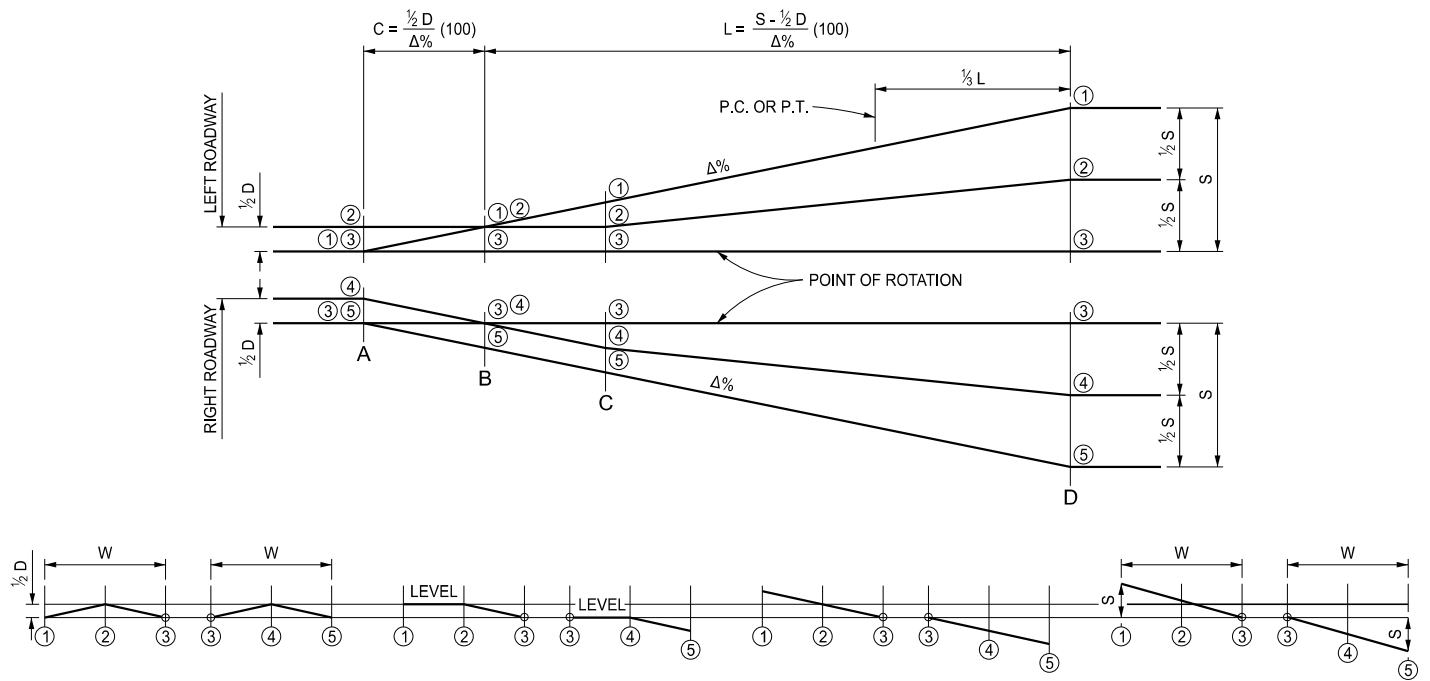
STANDARD PLAN FOR
SUPERELEVATION AND PAVEMENT CROWNS

(SPECIAL DETAIL)
FHWA APPROVAL

07/20/2026
PLAN DATE

R-107-I

SHEET
3 OF 7



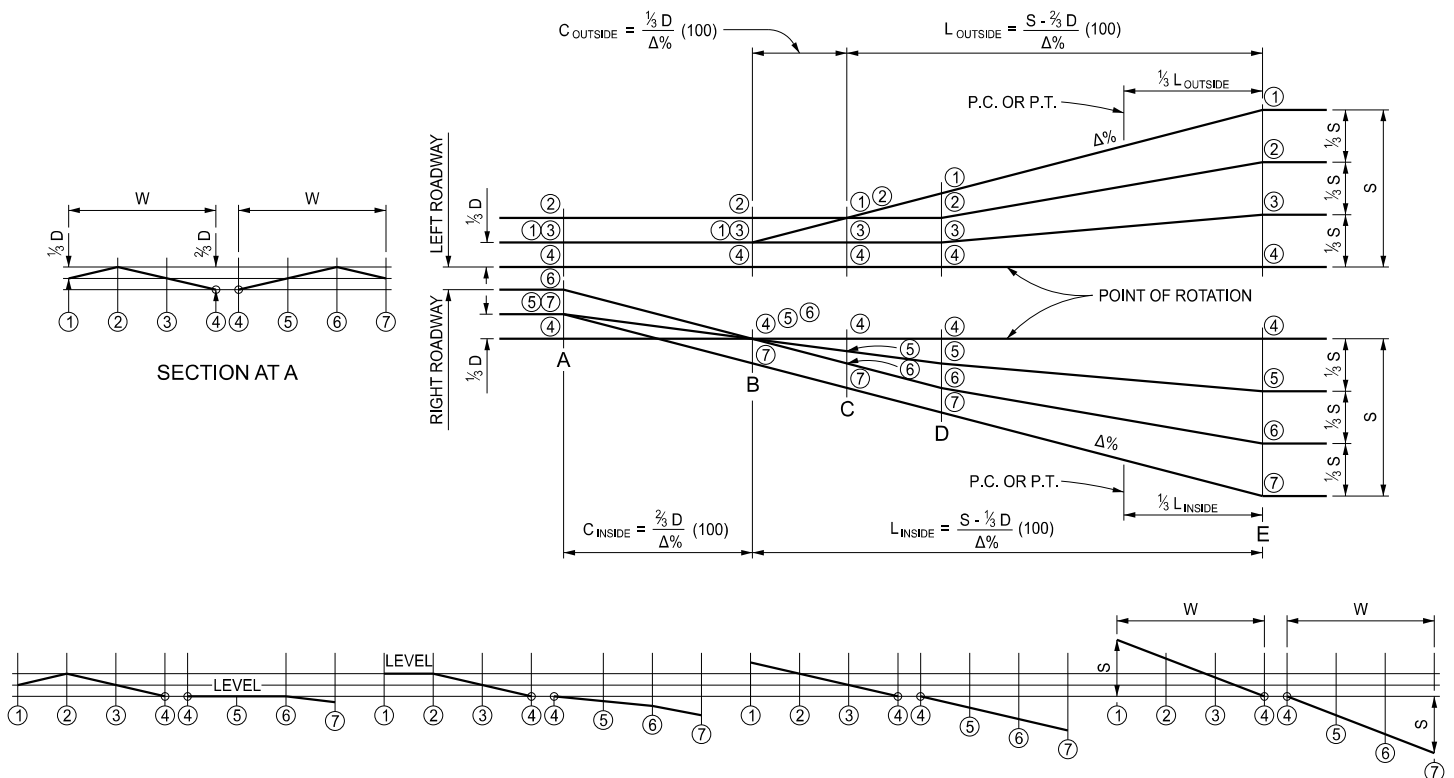
SECTION AT A

SECTION AT B

SECTION AT C

SECTION AT D

UNSPIRALED FOUR LANE DIVIDED ROADWAY



SECTION AT B

SECTION AT C

SECTION AT D

SECTION AT E

UNSPIRALED SIX LANE DIVIDED ROADWAY



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

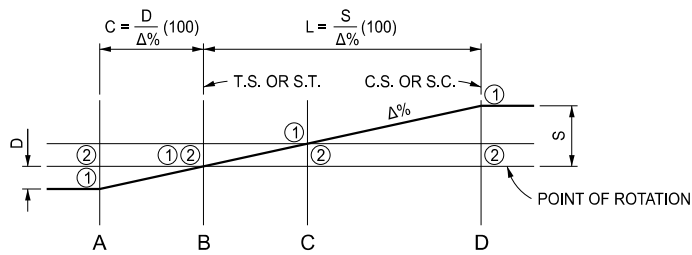
STANDARD PLAN FOR SUPERELEVATION AND PAVEMENT CROWNS

(SPECIAL DETAIL)
FHWA APPROVAL

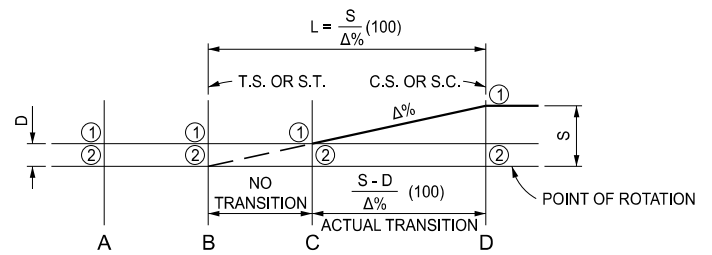
07/20/2026
PLAN DATE

R-107-I

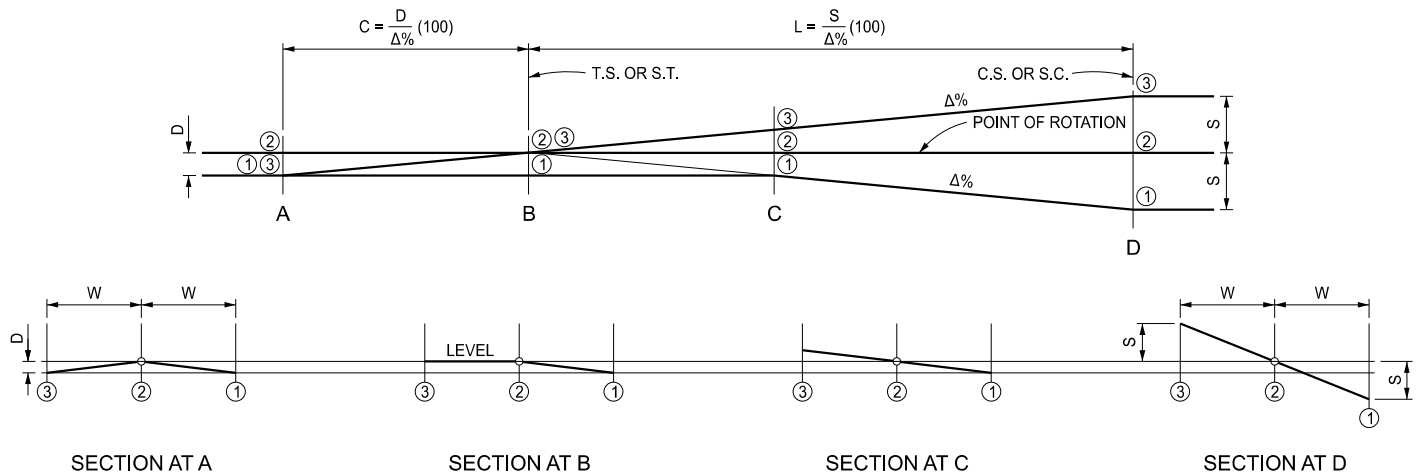
SHEET
4 OF 7



SPIRALED RAMP (CROWN ADVERSE TO SUPER)



SPIRALED RAMP (CROWN SAME DIRECTION AS SUPER)



SPIRALED TWO-WAY ROADWAY



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

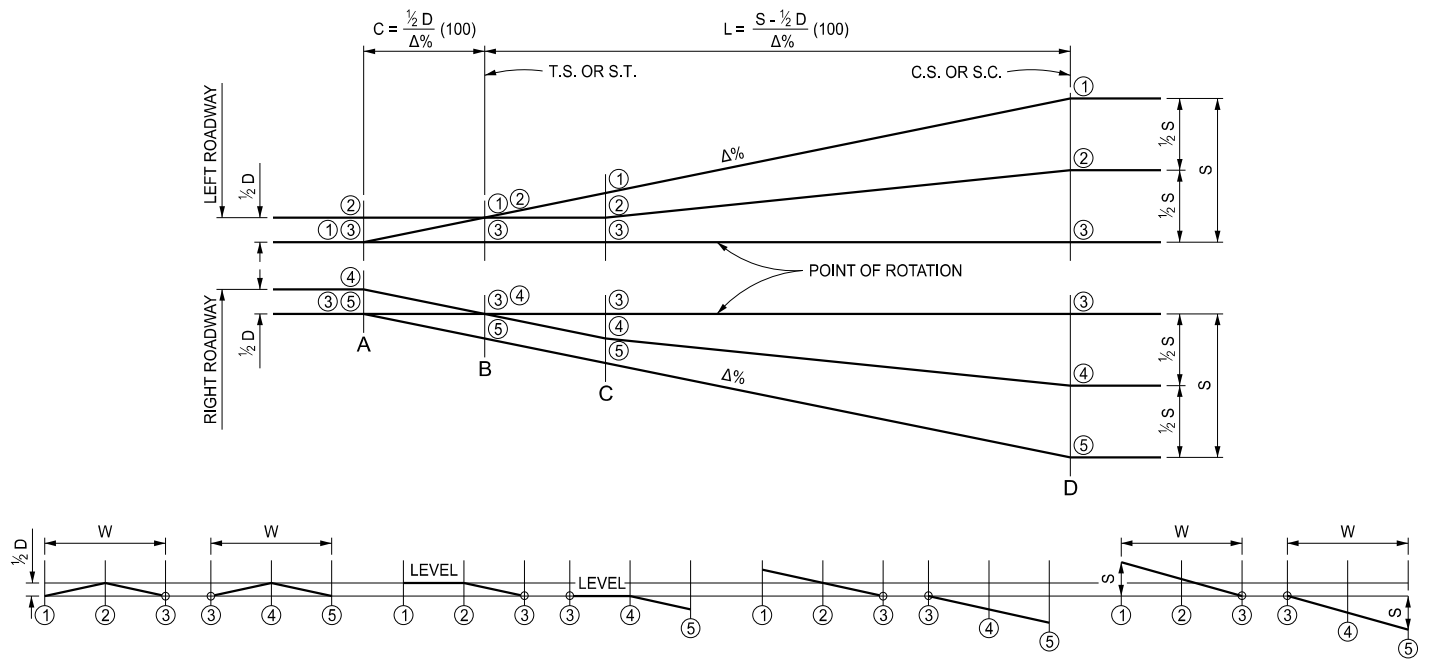
STANDARD PLAN FOR
SUPERELEVATION AND PAVEMENT CROWNS

(SPECIAL DETAIL)
FHWA APPROVAL

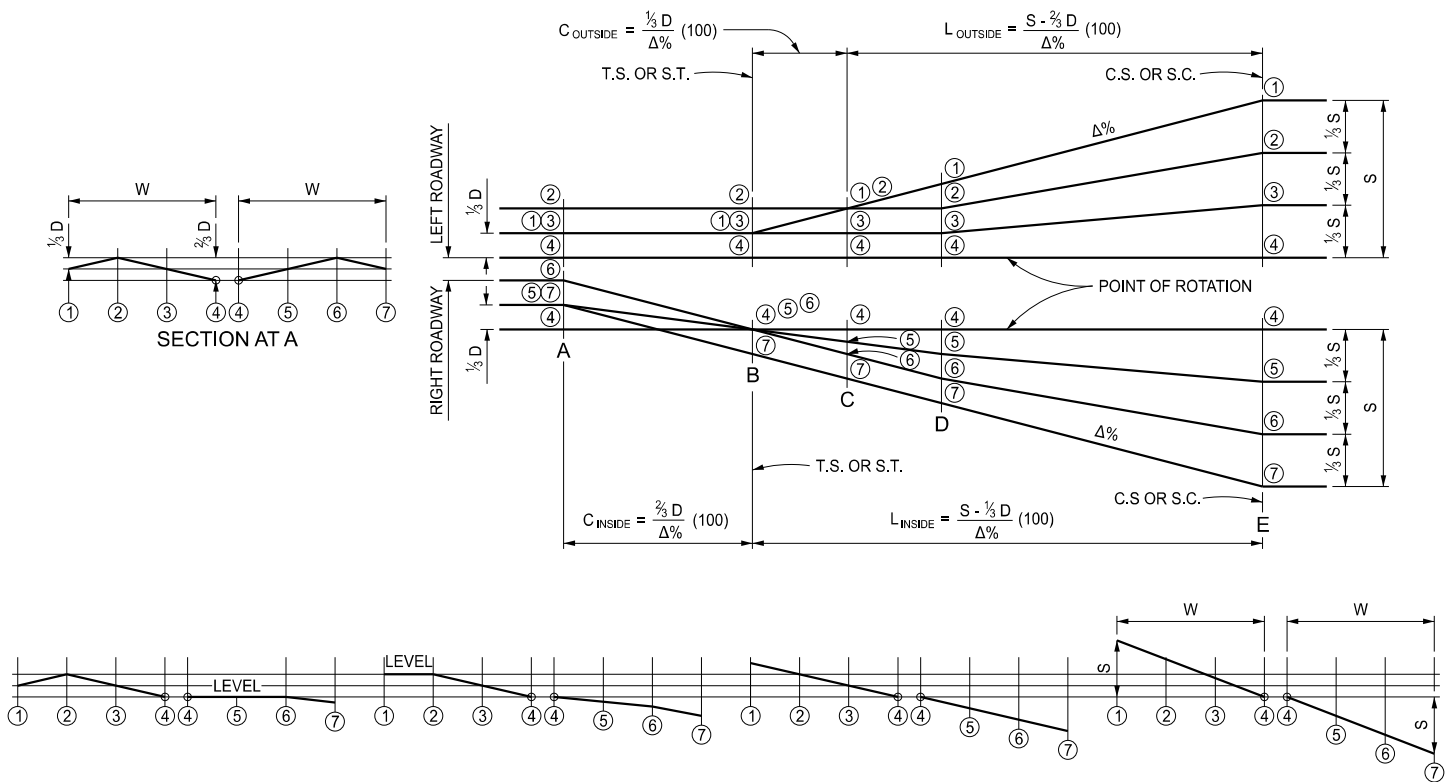
07/20/2026
PLAN DATE

R-107-I

SHEET
5 OF 7



SPIRALED FOUR LANE DIVIDED ROADWAY



SPIRALED SIX LANE DIVIDED ROADWAY



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

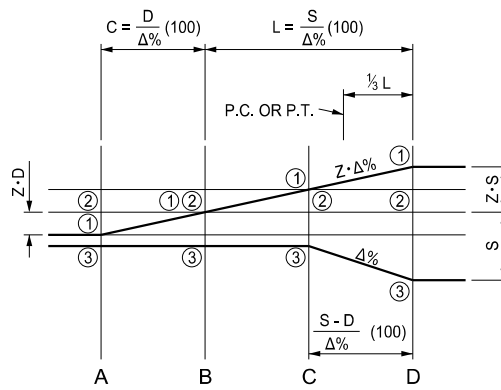
STANDARD PLAN FOR
SUPERELEVATION AND PAVEMENT CROWNS

(SPECIAL DETAIL)
FHWA APPROVAL

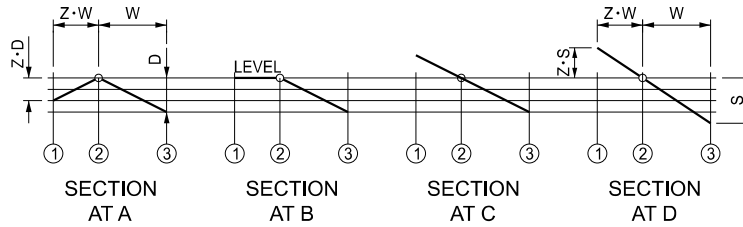
07/20/2026
PLAN DATE

R-107-I

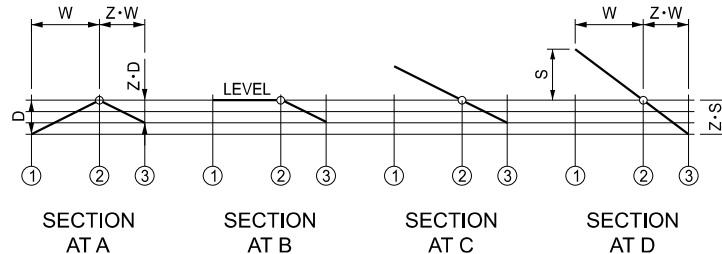
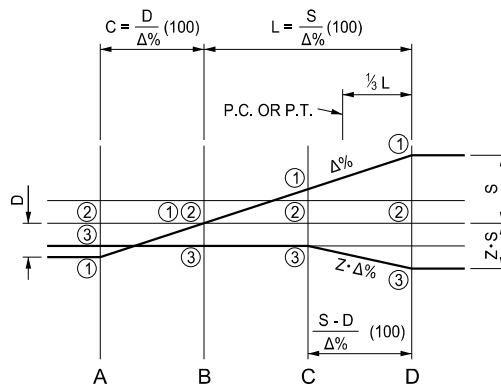
SHEET
6 OF 7



Z VALUES FOR UNSPIRALED TWO WAY ROADWAYS WITH AN ODD NUMBER OF LANES	
NUMBER OF LANES	Z
3	$\frac{1}{2}$
5	$\frac{2}{3}$
7	$\frac{3}{4}$



UNSPIRALED TWO WAY ROADWAY WITH ODD NUMBER OF LANES
(FARTHEST EDGE ON LOW SIDE)



UNSPIRALED TWO WAY ROADWAY WITH ODD NUMBER OF LANES
(FARTHEST EDGE ON HIGH SIDE)



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
SUPERELEVATION AND PAVEMENT CROWNS

(SPECIAL DETAIL)
FHWA APPROVAL

07/20/2026
PLAN DATE

R-107-I

SHEET
7 OF 7