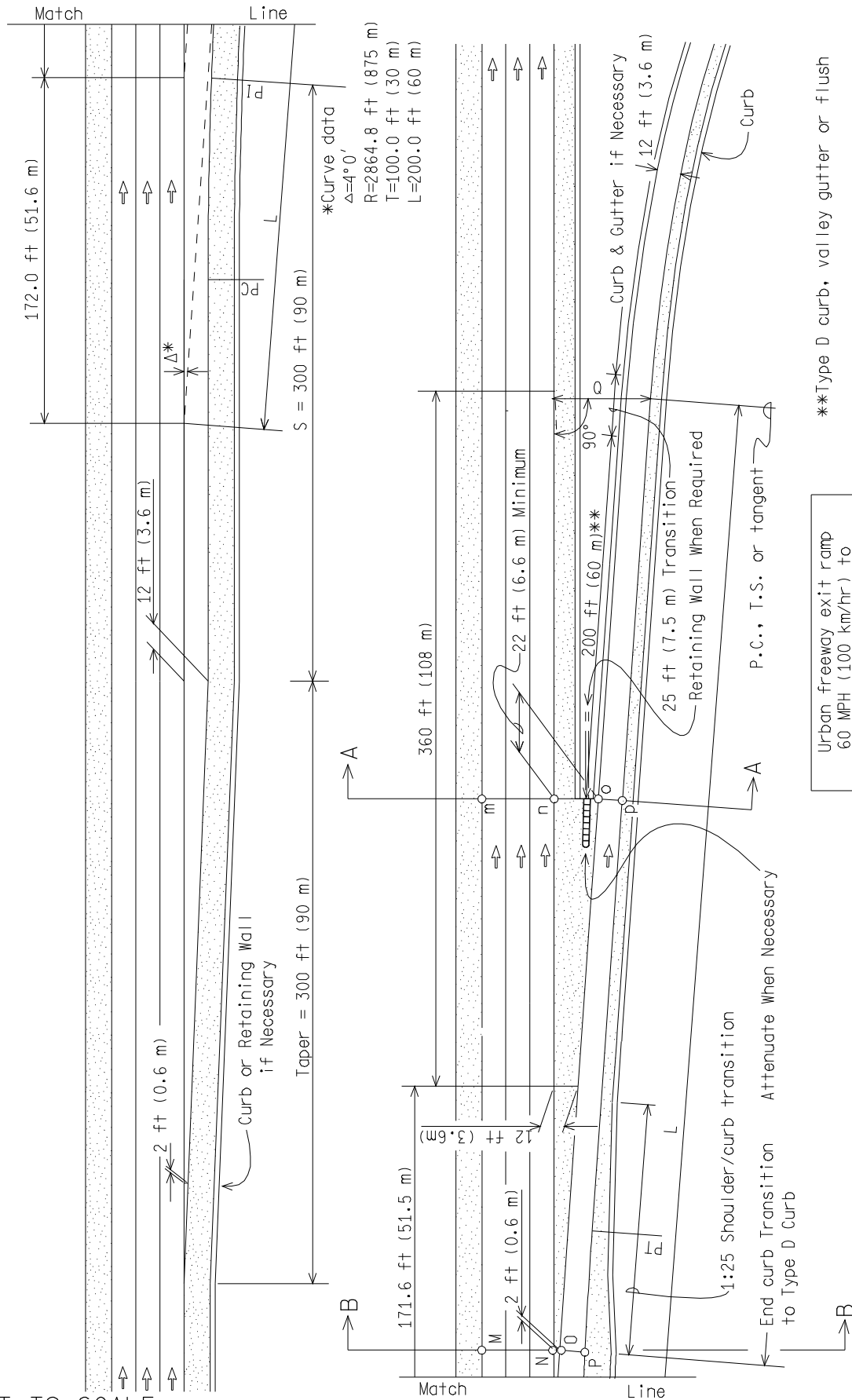


Exit Slip Ramp

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**Type D curb, valley gutter or flush

RAMP DIVERGE ANGLE	RAMP % GRADE	Urban freeway exit ramp	
		L (ft)	L (m)
$\Delta=4^{\circ}$	-3 to LESS THAN -5	687.6	213.5
	BETWEEN -3 AND +3	601.6	186.5
	+3 to LESS THAN +5	558.6	173.0
		0	0

60 MPH (100 km/hr) to
30 MPH (50 km/hr) deceleration

Note: Refer to Appendix 6-A of the current Road Design Manual for curb type and placement.



BY: *John C. Friend*
 ENGINEER OF DELIVERY

BY: *Paul A. Van Park*
 ENGINEER OF DEVELOPMENT

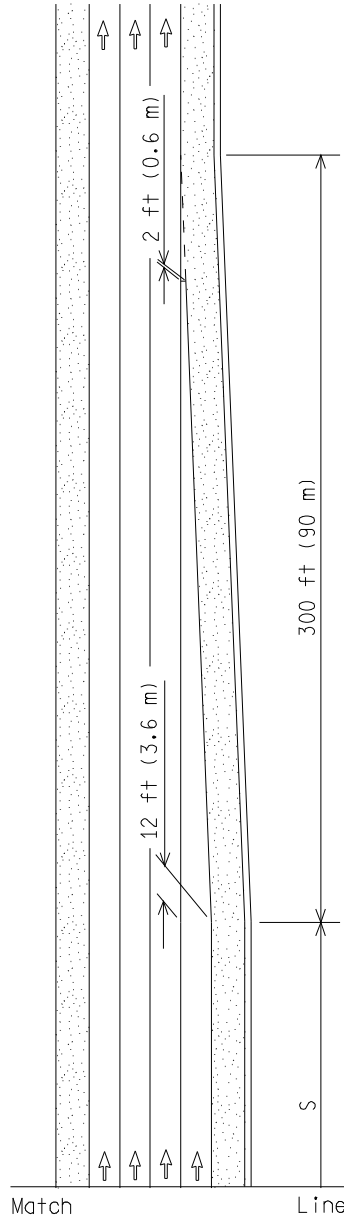
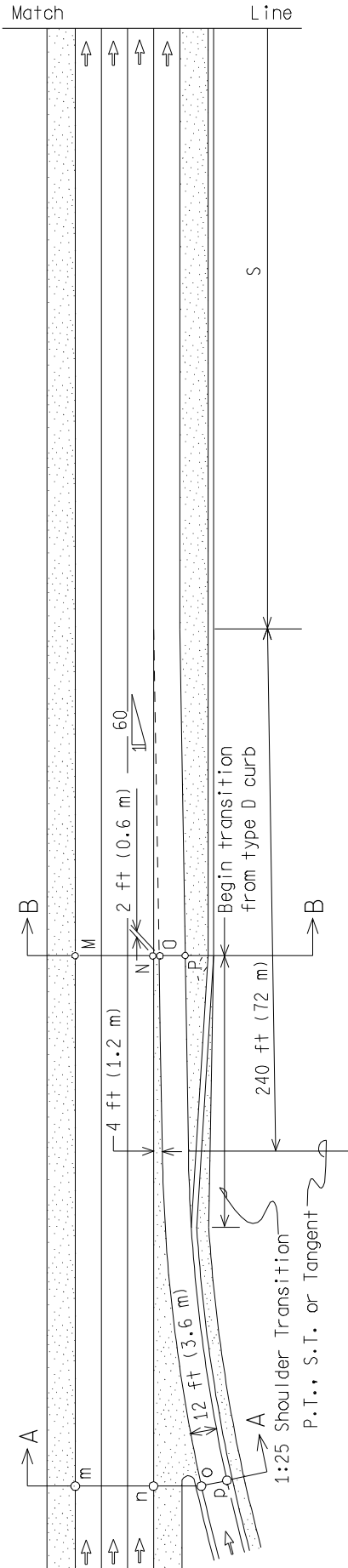
GEOMETRIC DESIGN GUIDE FOR
 12' WIDTH ENTRANCE
 AND EXIT SLIP RAMPS

08/07/2008
 PLAN DATE:

GEO-202-B

SHEET
 1 OF 4

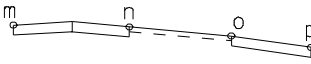
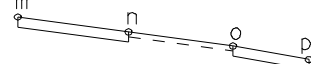
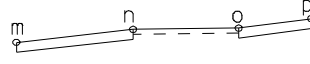
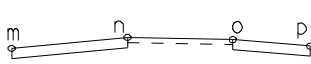
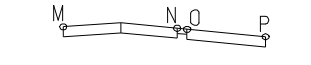
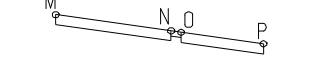
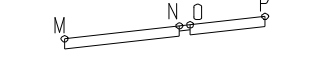
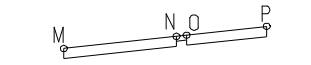
Entrance Slip Ramp



Urban freeway entrance ramp 60 MPH (100 km/hr) freeway design speed		S	
PERCENT GRADE OF THROUGH ROADWAY	(ft)	(m)	
-3 to LESS THAN -5	380	115	
BETWEEN -3 AND +3	680	185	
+3 to LESS THAN +5	1080	340	

NOT TO SCALE

EDGE OF PAVEMENT ELEVATION RELATIONSHIPS

WHEN THE THRU LANES ARE NOT SUPERELEVATED	WHEN THE THRU LANES ARE SUPERELEVATED AND N IS LOWER THAN M	WHEN THE THRU LANES ARE SUPERELEVATED AND N IS HIGHER THAN M	
		RAMP AND THRU LANE SUPERELEVATED IN SAME DIRECTION	RAMP AND THRU LANE SUPERELEVATED IN OPPOSITE DIRECTION
SECTION A-A			
 <p>POINTS n, o & p SHOULD BE PROGRESSIVELY LOWER.</p>	 <p>POINTS m, n, o & p SHOULD BE PROGRESSIVELY LOWER.</p>	 <p>POINT o SHOULD BE HIGHER THAN POINT n.</p>	 <p>POINT o SHOULD BE EQUAL TO OR LOWER THAN POINT n.</p>
SECTION B-B			
 <p>POINTS N, O & P SHOULD BE IN THE SAME PLANE.</p>	 <p>POINTS M, N, O & P SHOULD BE IN THE SAME PLANE.</p>	 <p>POINTS M, N, O & P SHOULD BE IN THE SAME PLANE.</p>	 <p>POINTS M, N, O & P SHOULD BE IN THE SAME PLANE.</p>

NOTE: Maximum algebraic difference in pavement cross slope between mainline and ramp auxiliary lane should not exceed 5%.

NOT TO SCALE

NOTES:

1. Select design speed based on a combination of the super elevation rate and the radius of the curve. See also chapter 3 of the MDOT Road Design Manual.
2. If an additional through lane is provided or the entrance ramp joins the mainline on the high side (outside) of the curve, use GEO-101-Series.
3. If the through pavement is curve, plot offsets for taper and connect with appropriate curve.
4. Prepare detail grades and profiles from Section A-A to Section B-B.
5. A curve on the exit ramp beyond the gore may be introduced when necessary but should have a 1145 ft (350m) minimum radius for slip exit ramps.
6. Radii less than 500 ft (105m) would require lane widening to 16 ft (4.8m).
7. A parallel entrance acceleration lane length "S" of at least 1080' (324 m), plus taper, is desirable wherever it is anticipated that the ramp and freeway will carry traffic volumes approximately equal to the design capacity of the merging area.
8. Spirals transition should be used on new ramp alignments based on the design speed of the curve and the radius as shown in the table of the Road Standard Plan R-107-Series. The table gives the Maximum radius in which a spiral should be used.
9. The maximum algebraic difference in pavement cross slope between the mainline and the ramp auxiliary lane should not exceed 5%.
10. Super elevation should conform to Standard Plan R-107-Series. The maximum rate of super elevation for ramp curves should be 5%.
11. The cross slope in the gore area between the 2 ft (0.6m) point and the 22 ft (6.6 m) point should not exceed 8%, with a 6% maximum algebraic difference in cross slope between the gore and the adjacent paved lane. The algebraic difference also applies within crowned gores.
12. The design speed of the ramp vertical alignment should meet or exceed the design speed of the ramp horizontal alignment.
13. The mainline shoulder width should extend along the ramp to where the gore is 2 ft (0.6 m) wide. Use a 1:25 taper transition where it joins the ramp shoulder paving.
14. Each ramp should be carefully studied to provide maximum vision at their merge points. See Geometric Design Guide GEO-300-Series.
15. The sight distance in advance of the exit ramp gore should be at least 25% longer than the minimum stopping sight distance for the design speed of the mainline.
16. These design concepts are for new construction. Where modifications are needed for retrofitting to existing road features, consult the Geometric Design Unit of Lansing Traffic and Safety.

NOT TO SCALE