
APPENDIX C. ENHANCED MARKINGS FOR RUNWAY HOLDING POSITION

1. GENERAL.

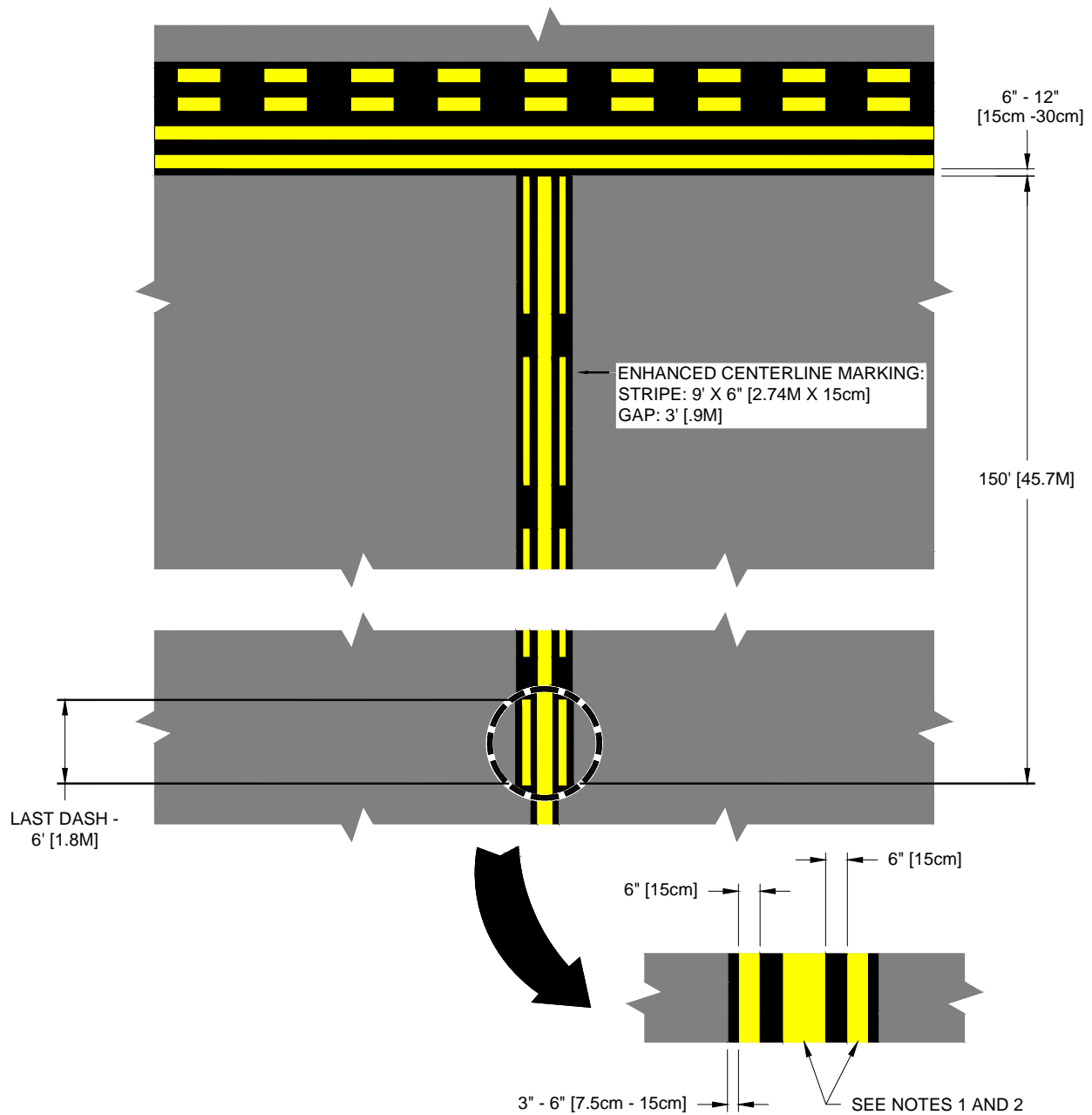
Enhanced taxiway markings are intended to provide additional visual cues to taxiing pilots to help them identify the location of the runway holding position. This appendix provides standards for these enhanced markings and guidance, including examples, on where to use the enhanced markings.

The figures included in this appendix are not drawn to scale.

2. APPLICABILITY.

The guidelines and standards for enhanced taxiway markings contained in this appendix may be used as a runway incursion prevention initiative. They may be used in combination or separately with existing taxiway markings. However, all intersections at an airport must use the same combination of markings.

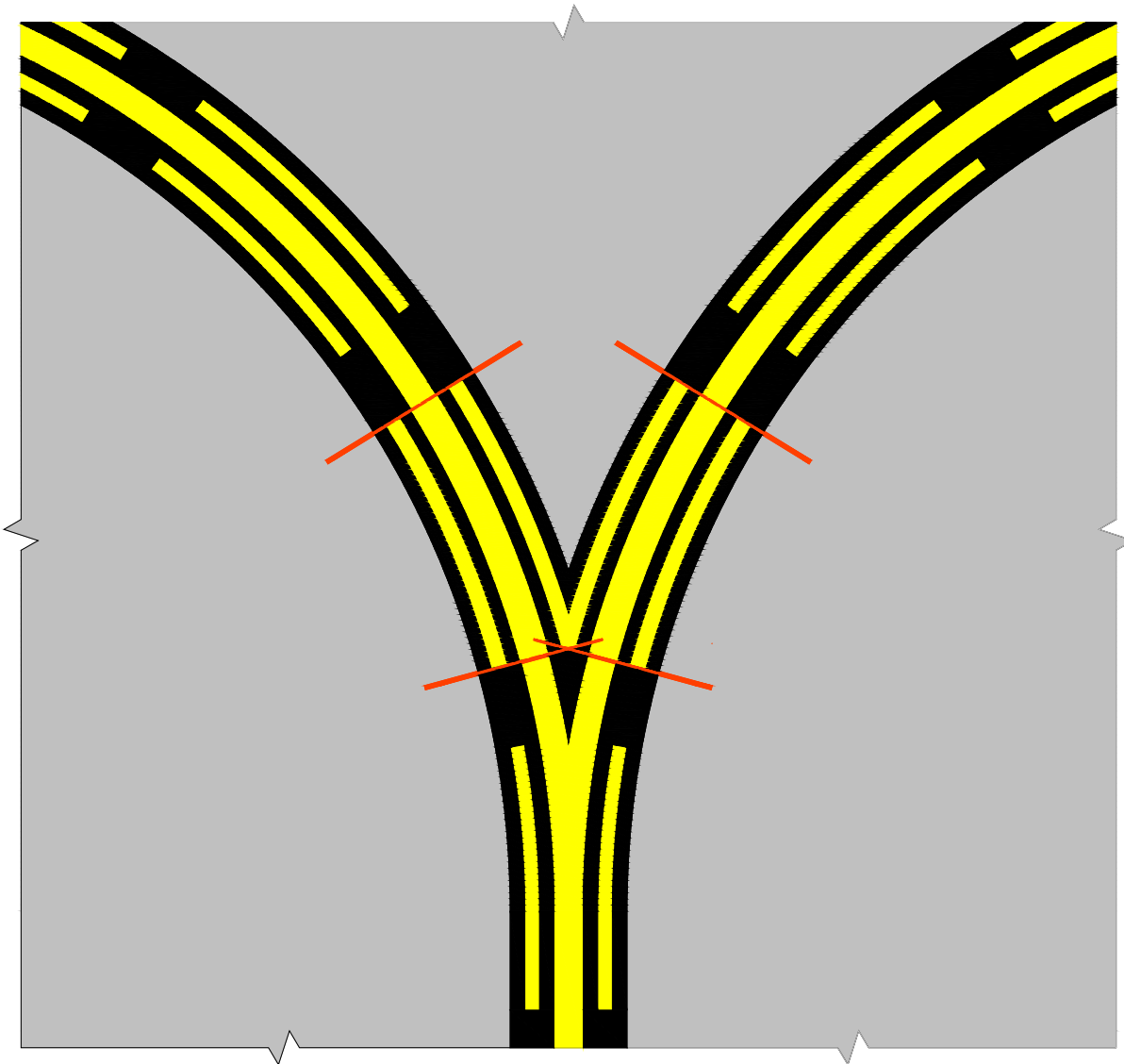
3. ENHANCED TAXIWAY CENTERLINE MARKINGS.



NOTES:

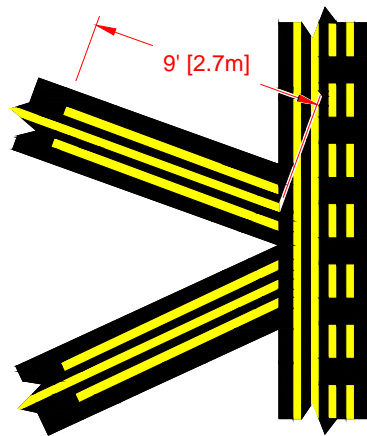
1. DASHED LINES FOR THE ENHANCED TAXIWAY CENTERLINE MARKING ARE 6" [15cm] IN WIDTH AND SEPARATED 6" [15cm] FROM THE TAXIWAY CENTERLINE. THIS APPLIES TO BOTH 6" [15 cm] AND 12" [30 cm] TAXIWAY CENTERLINE MARKINGS.
2. THE TAXIWAY CENTERLINE MARKINGS MAY BE SHIFTED LEFT OR RIGHT TO AVOID INTERFERENCE WITH THE TAXIWAY CENTERLINE LIGHTS.

Figure C - 1. Enhanced Taxiway Centerline Markings



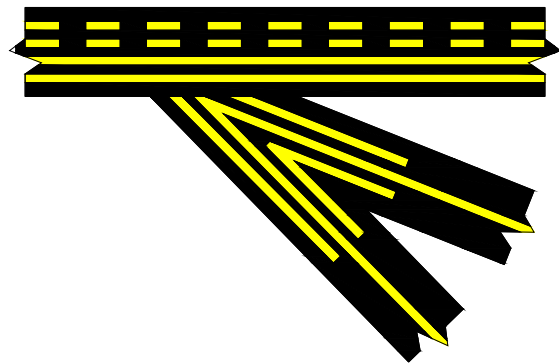
NOTE:
AS SHOWN IN THIS CASE THE V -SHAPED INNER DASHES START AND STOP WITH THE OUTSIDE
9 FOOT [3 M] DASHES. HOWEVER THIS MAY NOT ALWAYS BE THE CASE FOR THE INNER DASHES.
IF THE V-SHAPED ARE LESS THAN 5 FEET [1.5 M] THEY MAY BE OMITTED.

Figure C - 2. Dashed Lines at Converging Taxiway Centerlines

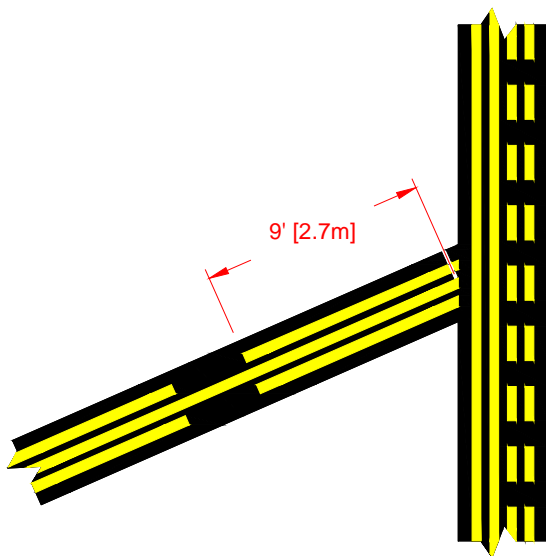


DETAIL A
Example of two straight enhanced taxiway centerline markings intersecting the runway holding position marking.

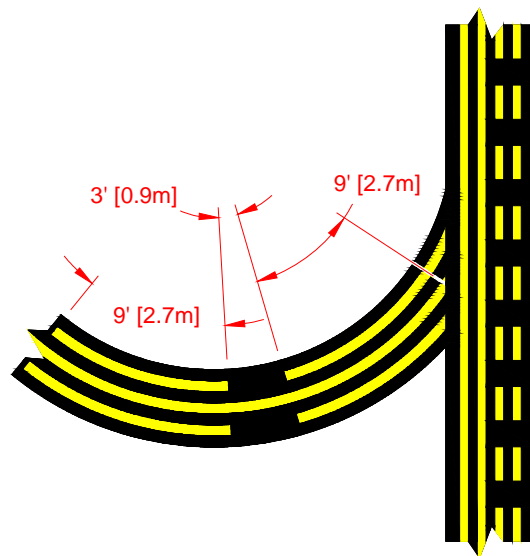
PARTIAL INNER DASHES INCLUDED BECAUSE THEY EXCEED 5 FEET IN LENGTH. ACCEPTABLE TO OMIT ANY DASHES THAT ARE LESS THAN 5' [1.5m] IN LENGTH.



DETAIL B
Example of converging enhanced taxiway centerline markings intersecting at an angle of less than 90° with runway holding position marking.



DETAIL C
Example of straight enhanced taxiway centerline markings intersecting with runway holding position marking.



DETAIL D
Example of curved enhanced taxiway centerline markings intersecting with runway holding position marking.

NOTE: ALL MEASUREMENTS ARE TAKEN ALONG THE CENTER OF THE CENTERLINE.

Figure C - 3. Converging, Straight, and Curved Enhanced Taxiway Centerlines Intersecting with Holding Position Marking

4. ENHANCED RUNWAY HOLDING POSITION MARKINGS.

The enhanced runway holding position marking, applicable only to those taxiway entrances that serve Airplane Design Group (ADG) V or VI airplanes, measures 125 feet (38 m) from one paved shoulder to the other paved shoulder, i.e., 62.5 feet (19 m) from the main taxiway centerline. Figure C-4 illustrates the enhanced surface marking on a standard 75-foot (23-m) wide taxiway with a standard 35-foot (10.5-m) wide taxiway shoulder for ADG V. For taxiways wider than 75 feet (22.9 m) that serve ADG V or VI aircraft, the holding position line is extended so it is 25 feet (7.5 m) on both paved taxiway shoulders.

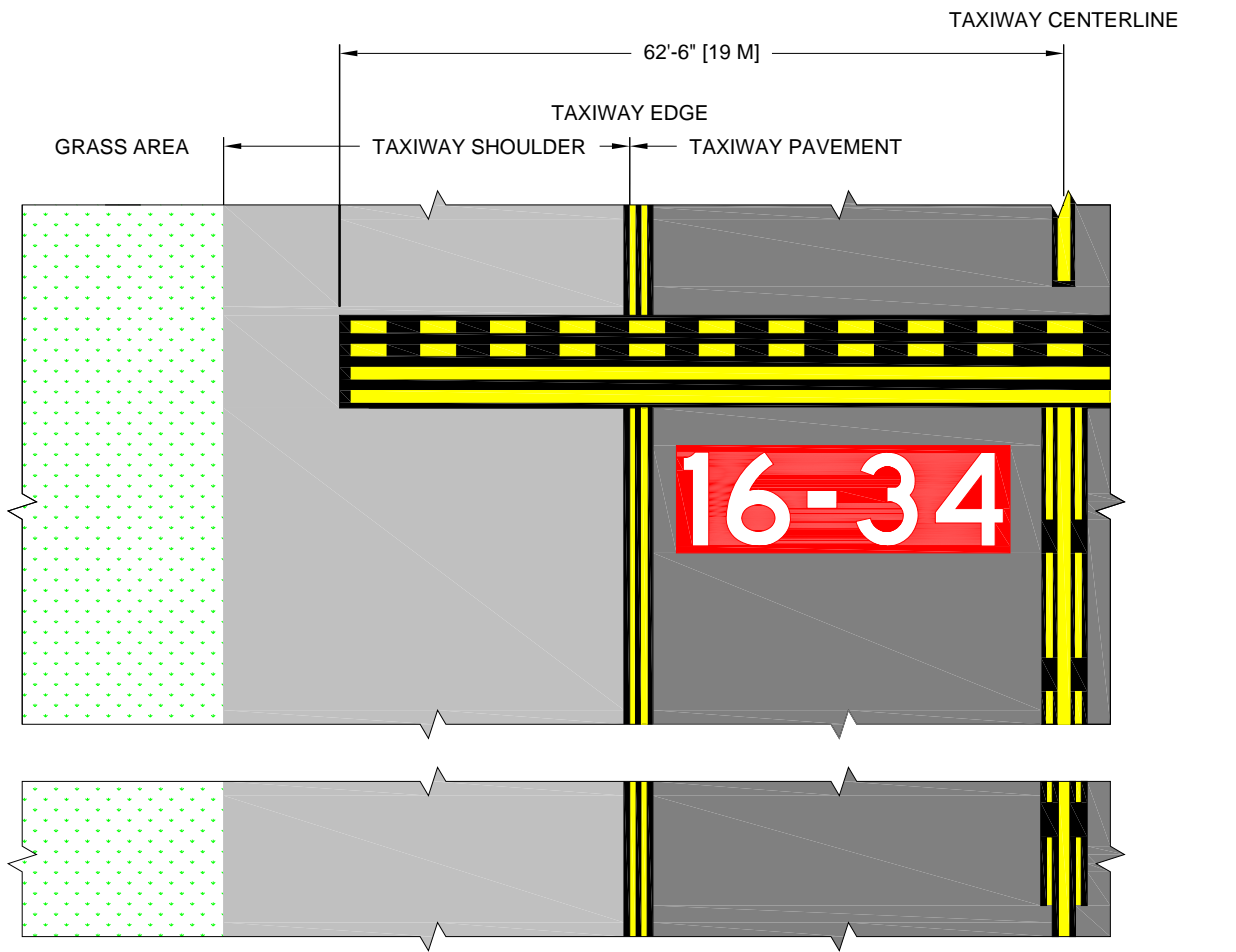


Figure C - 4. Enhanced Runway Holding Position Markings on Taxiways

5. SURFACE PAINTED HOLDING POSITION SIGNS.

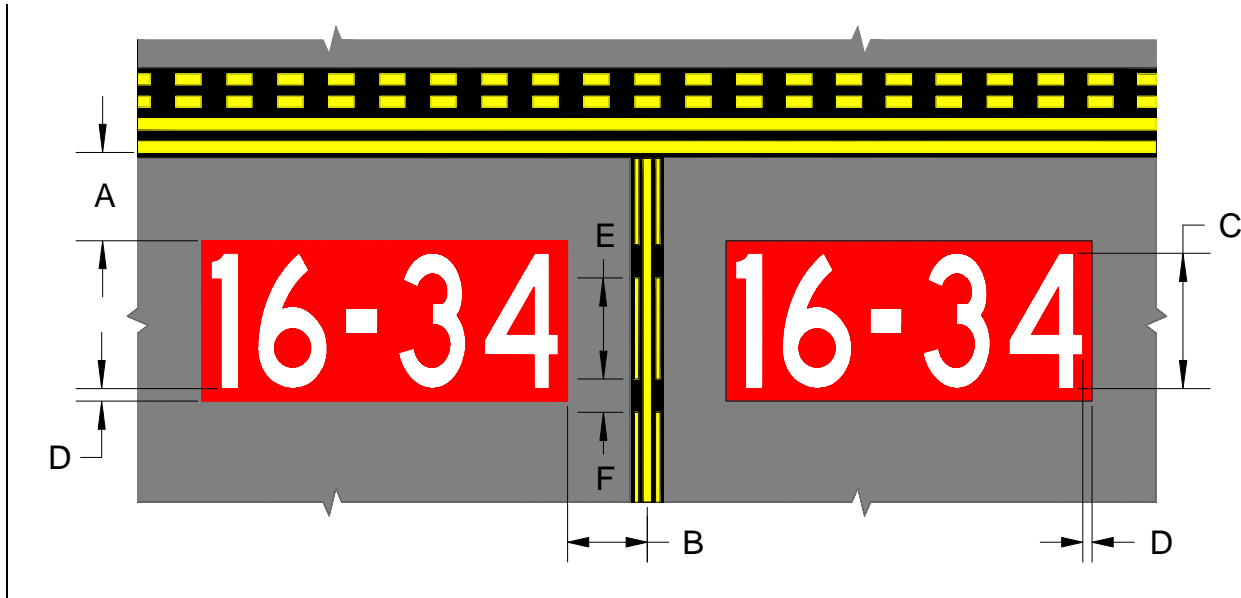


Figure C - 5. Surface Painted Holding Position Signs for Taxiway Widths Greater Than 35 Feet (10.5 m)

Dimension Letter	Dimension feet (meters)	Notes
A	2 – 4 (0.67 – 1.34)	
B	3 – 10 (0.91 – 3.0)	
C	9 – 12 (2.75 – 3.7)	Inscriptions must have a height of 12 feet (3.7 m); however, the height may be reduced, as necessary, to the minimum height of 9 feet (2.75 m). In special situations, the surface painted marking may be reduced to less than 9 feet (2.75 m) in order to fit the marking appropriately. Examples of special situations include taxiways with widths narrower than 75 feet (22.9 m) or taxiways that need to display multiple runway designations with arrows. In all cases, inscriptions follow Appendix A inscription criteria. All other taxiway entrances to the same runway not needing the reduction are to maintain the 12 foot (3.7 m) height dimension. For practicality, the lowest height reduction is 6 feet (1.8 m). In all cases, the dimension D is not reduced.
D	15 inches (38 cm)	
E	9 (2.75)	
F	3 (0.91)	

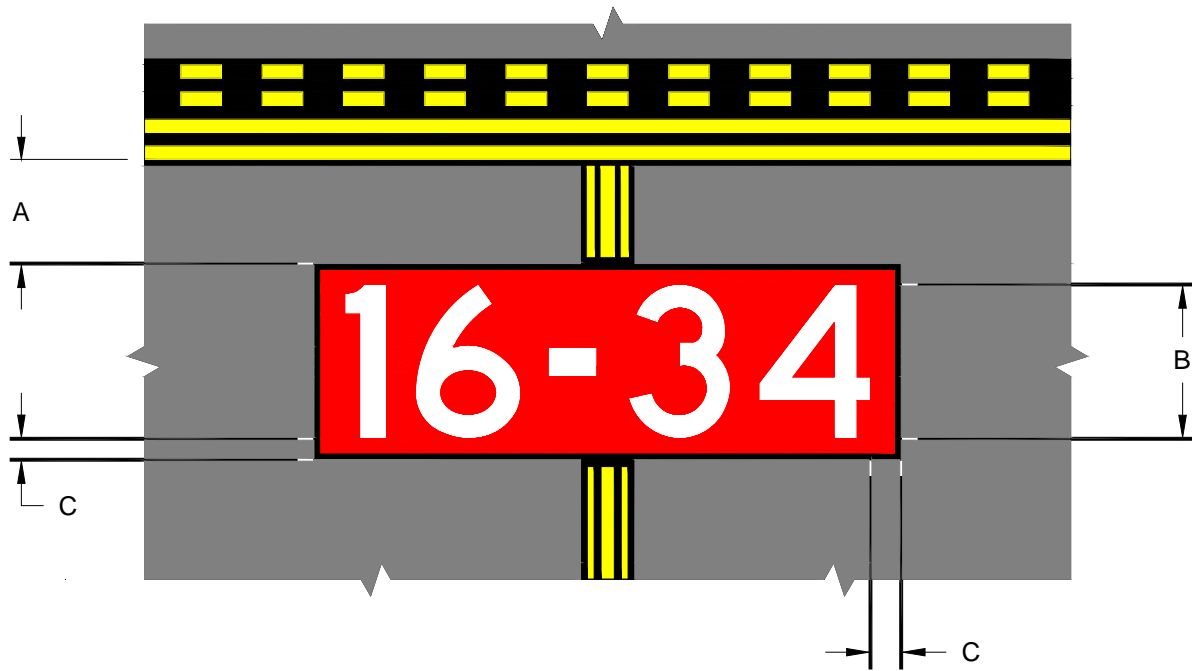


Figure C - 6. Surface Painted Holding Position Sign for Taxiway Widths Equal to or Less Than 35 Feet (10.5 m)

Dimension Letter	Dimension feet (meters)	Notes
A	2 – 3 (0.67 – 0.91)	
B	6 (1.8)	Inscriptions follow Appendix A inscription criteria. The size of the sign inscription is scaled to fit taxiways 35 feet (10.5 m) or less in width for Airplane Design Groups I and II. Reference AC 150/5300-13. In special situations, the surface marking may be reduced to less than 6 feet (1.8 m) in order to fit the marking appropriately. Examples of special situations include taxiways that need to display multiple runway designations with arrows. In all cases, the inscriptions follow Appendix A inscription criteria. All other taxiway entrances to the same runway not needing the reduction are to maintain the 6-foot (1.8-m) height dimension. For practicality, the lowest height reduction is 3 feet (0.91 m).
C	7.5 in (19 cm)	
NOTE		The dimensions for the enhanced taxiway centerline are in Figure C-1. The spacing between the enhanced taxiway centerline and the surface painted holding position sign is 6 -12 inches (15 – 30 cm) see figure C-1.

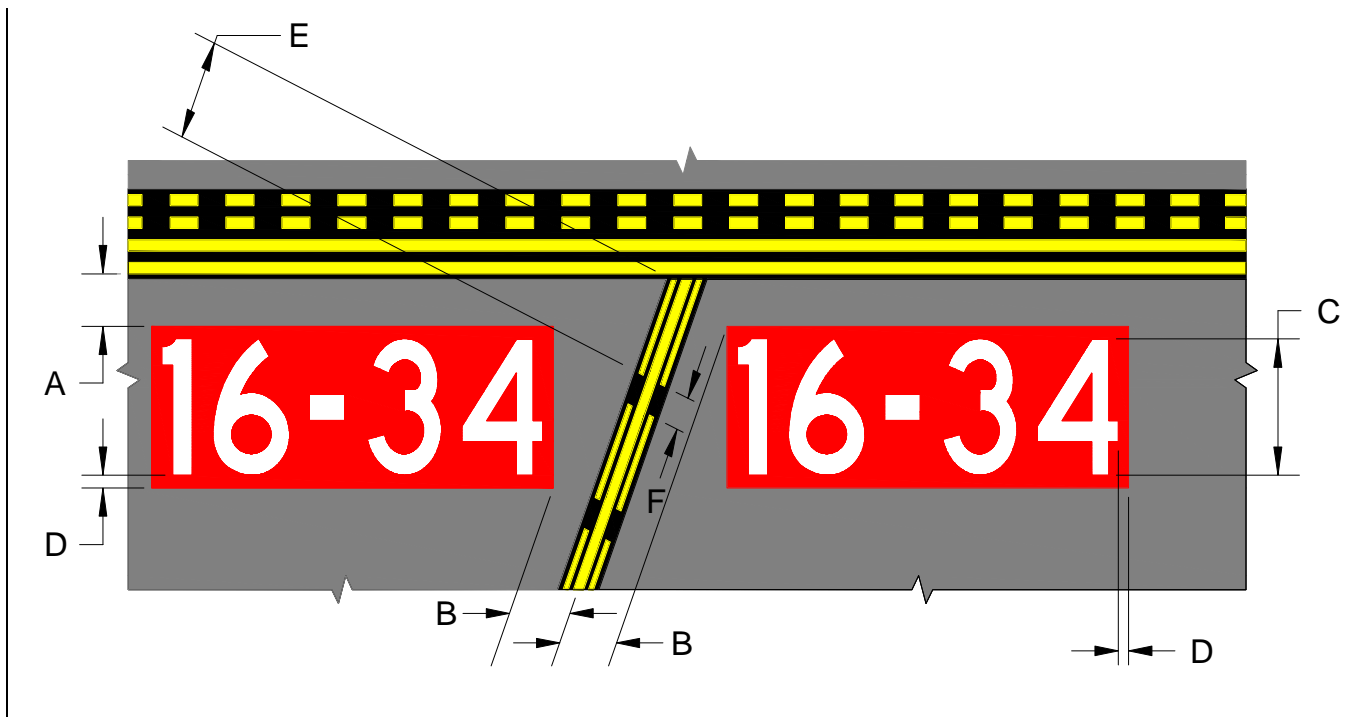


Figure C - 7. Surface Painted Holding Position Signs when Taxiway Centerline is not Perpendicular to Runway Holding Position Marking

Dimension Letter	Dimension feet (meters)	Notes
A	2 – 4 (0.67 – 1.34)	
B	3 – 10 (0.91 – 3.0)	
C	9 – 12 (2.75 – 3.7)	Inscriptions must have a height of 12 feet (3.7 m); however, the height may be reduced, as necessary, to the minimum height of 9 feet (2.75 m). In special situations, the surface painted marking may be reduced to less than 9 feet (2.75 m) in order to fit the marking appropriately. Examples of special situations include taxiways with widths narrower than 75 feet (22.9 m) or taxiways that need to display multiple runway designations with arrows. In all cases, inscriptions follow Appendix A inscription criteria. All other taxiway entrances to the same runway not needing the reduction are to maintain the 12-foot (3.7-m) height dimension. For practicality, the lowest height reduction is 6 feet (1.8 m). In all cases, the dimension D is not reduced.
D	15 inches (38 cm)	
E	9 (2.75)	
F	3 (0.91)	

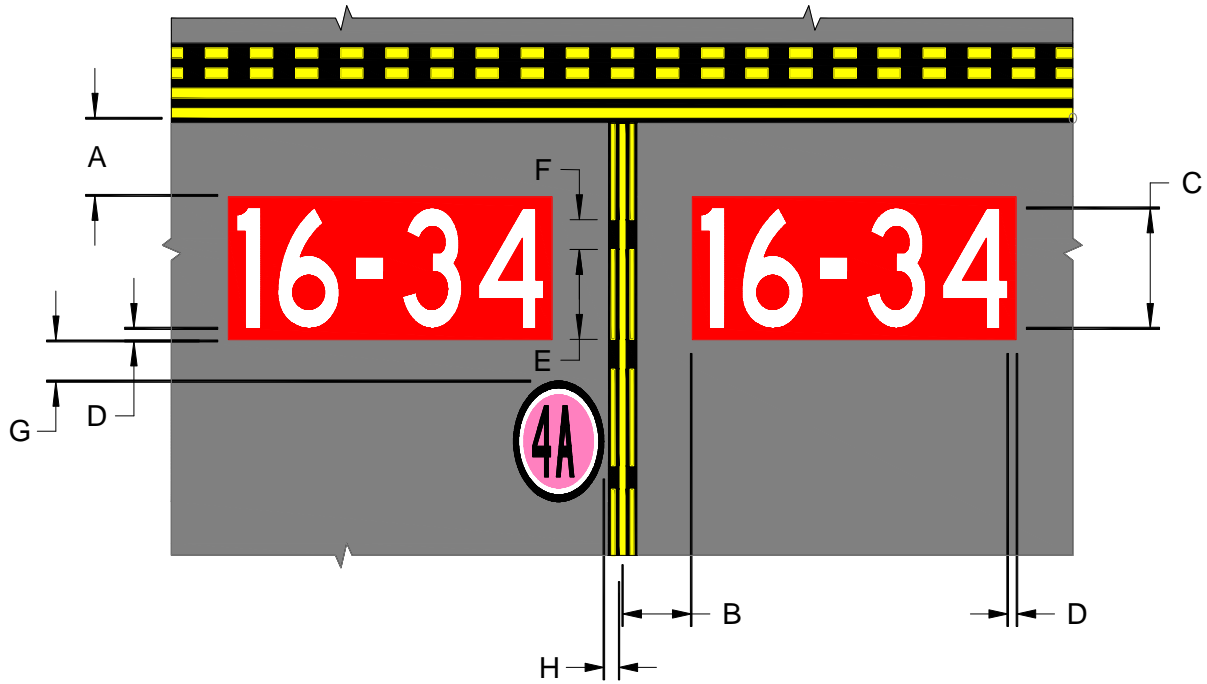


Figure C - 8. Surface Painted Holding Position Signs Co-Located with Geographic Position Marking

Dimension Letter	Dimension feet (meters)	Notes
A	2 – 4 (0.67 – 1.34)	
B	3 – 10 (0.91 – 3.0)	
C	9 – 12 (2.75 – 3.7)	Inscriptions must have a height of 12 feet (3.7 m); however, the height may be reduced, as necessary, to the minimum height of 9 feet (2.75 m). In special situations, the surface painted marking may be reduced to less than 9 feet (2.75 m) in order to fit the marking appropriately. Examples include taxiways with widths narrower than 75 feet (22.9 m) or taxiways that need to display multiple runway designations with arrows. In all cases, the inscriptions follow Appendix A inscription criteria. All other taxiway entrances to the same runway not needing the reduction are to maintain the 12-foot (3.7-m) height dimension. For practicality, the lowest height reduction is 6 feet (1.8 m). In all cases, the dimension D is not reduced.
D	15 inches (38 cm)	
E	9 (2.75)	
F	3 (0.91)	
G	4 (1.3)	From edge of red border
H	2 (0.65)	From outermost edge of main yellow taxiway centerline

Note: Because the geographic position marking cannot be located at a runway holding position for the low-visibility runway (see paragraph 4.11), this figure applies only where the designated taxi route for low-visibility operations crosses a runway that is not itself the low-visibility runway.

6. ADDITIONAL GUIDELINES FOR APPLICATION.

The following illustrations provide examples of various runway holding position locations using the enhanced markings. The figures included in this appendix are not drawn to scale.

a. Two Taxiway Centerlines Converging at a Runway Holding Position Marking. Where two taxiway centerlines converge at a runway holding position marking, the surface painted holding position signs must be installed parallel to the runway holding position marking. As shown in figure C-9, only one sign on either side of the two taxiway centerlines is practical.

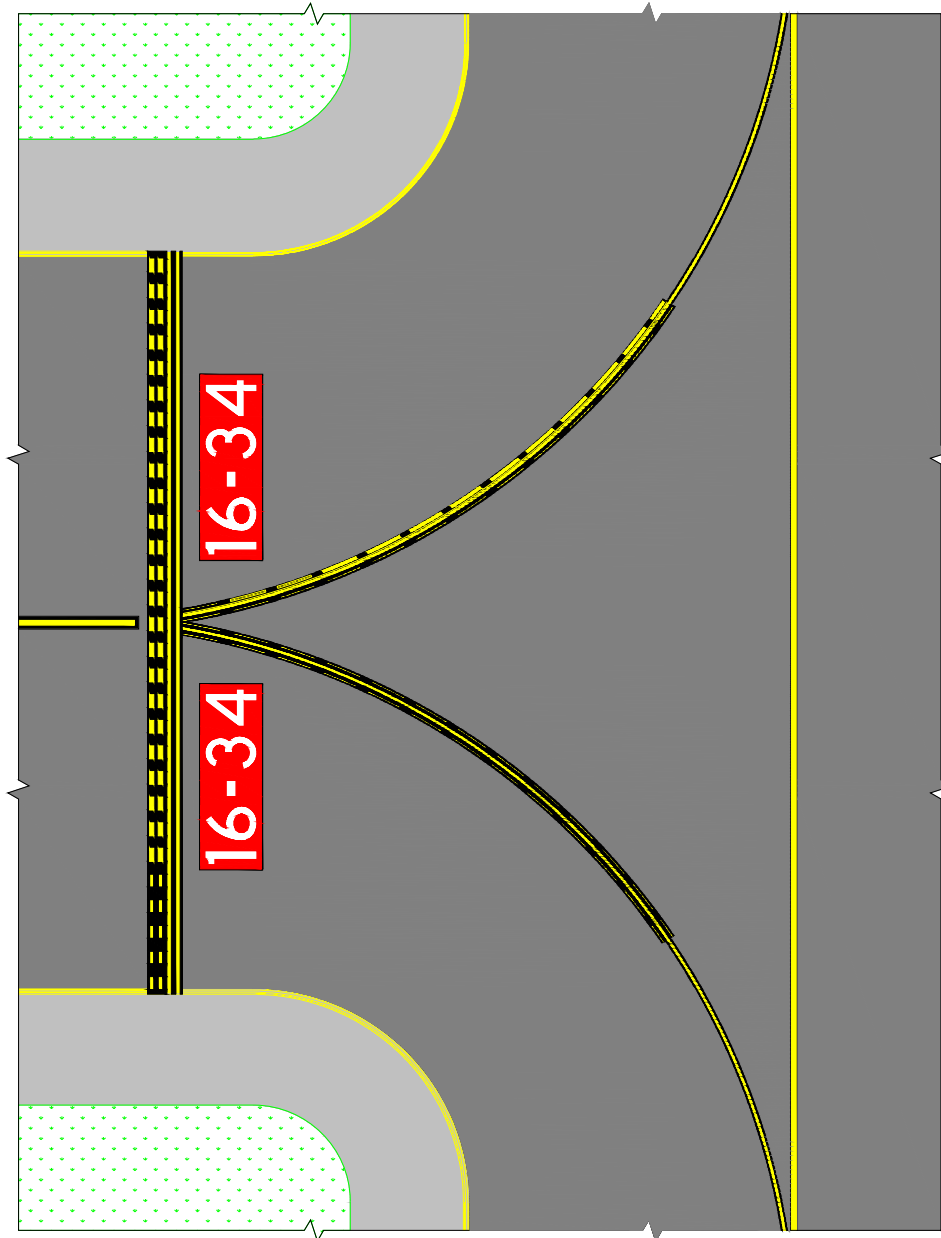
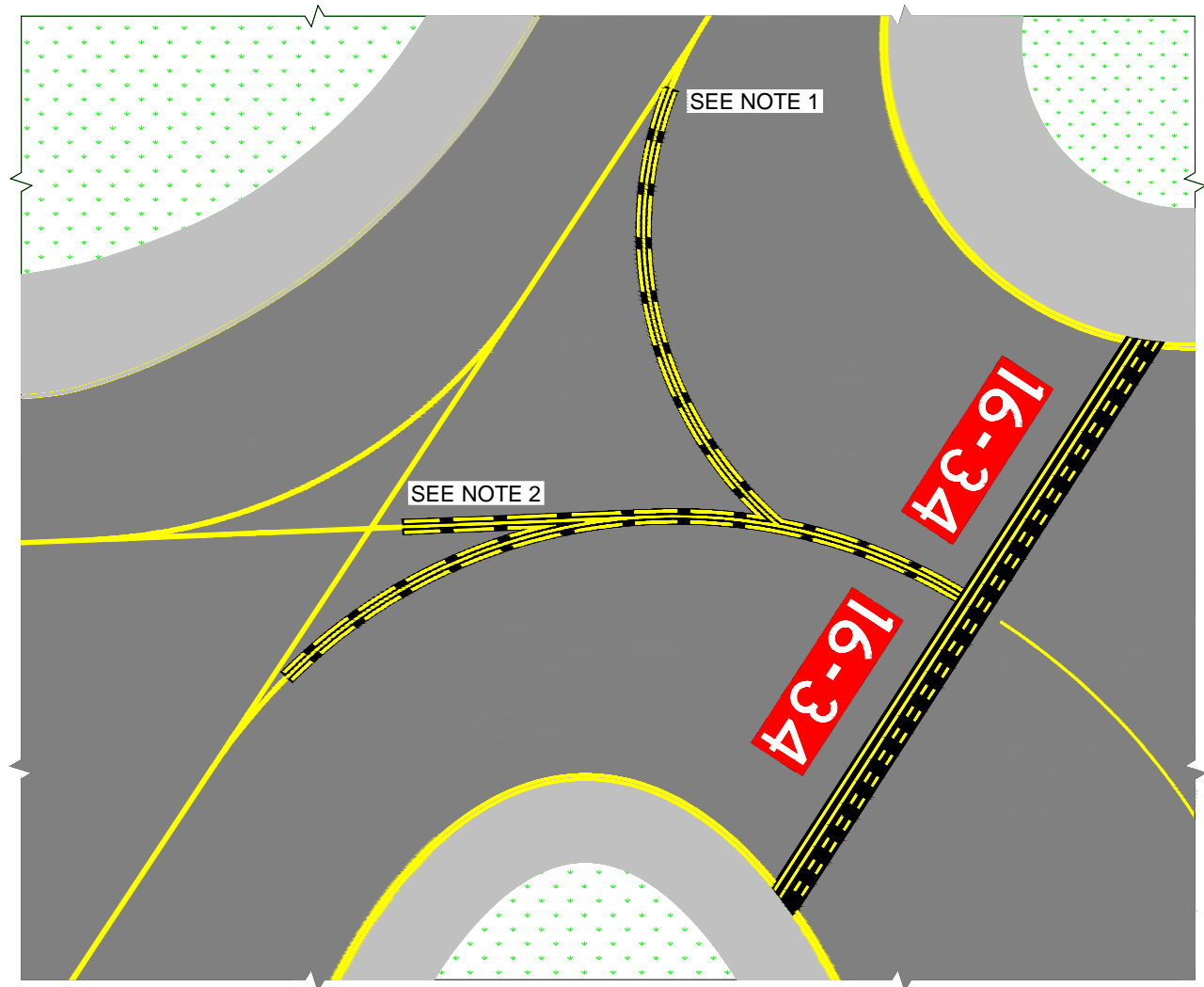


Figure C - 9. Two Taxiway Centerlines Converging at a Runway Holding Position Marking

c. Intersection of Three Converging Taxiway Centerlines. Figure C-11 illustrates taxiway centerline configurations when there are three converging centerlines.



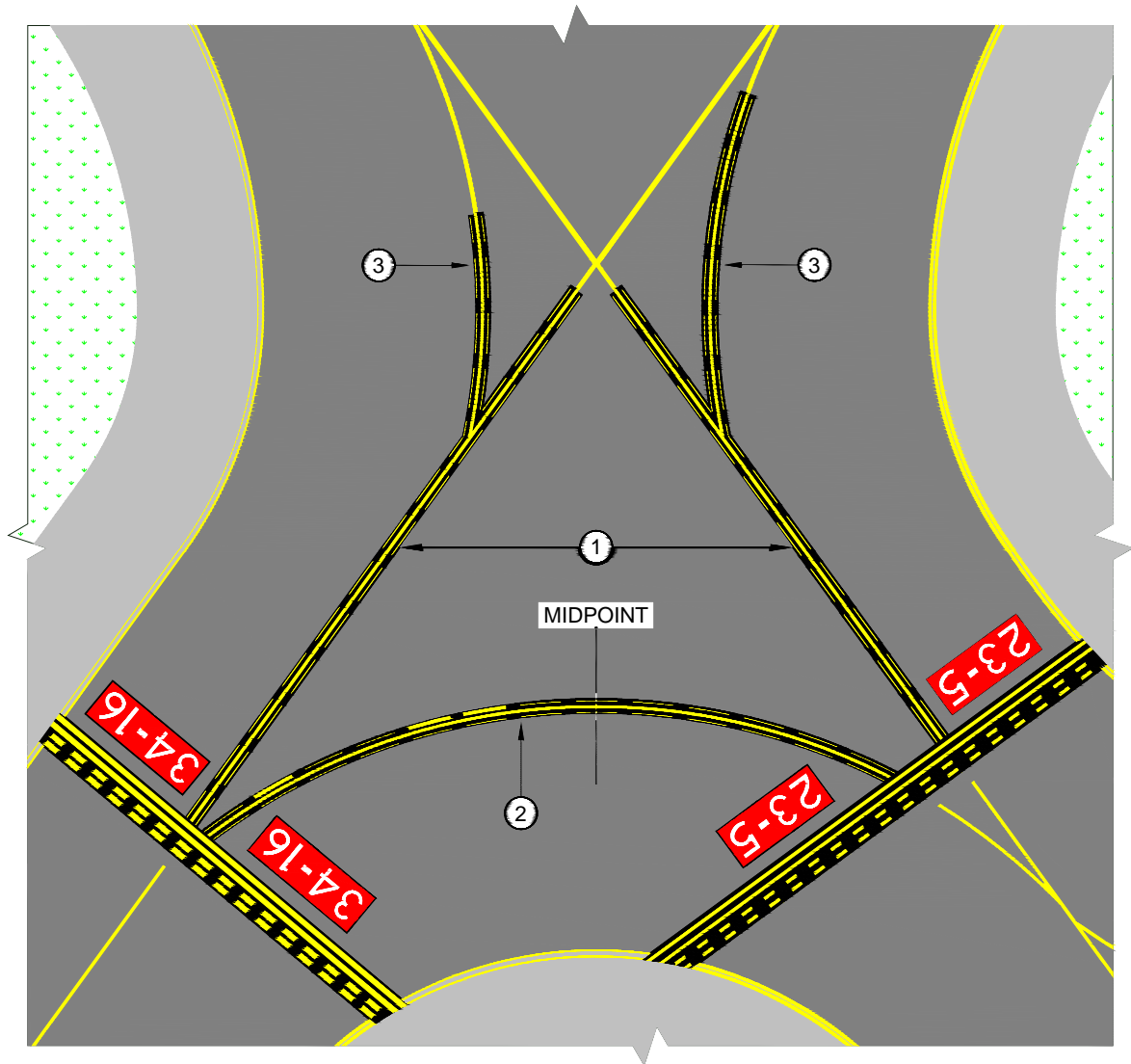
NOTES:

1. ENHANCEMENT IS TANGENT TO MERGING CURVE.
2. ENHANCEMENT TERMINATES 5 FEET [1.5m] FROM INTERSECTION.

Figure C - 11. Intersection of Three Converging Taxiway Centerlines

d. Intersection of Multi-Taxiway Centerlines with Less than 150 Feet (45.7 m) Between Taxiways. Figure C-12 illustrates different taxiway centerline configurations when there are three

converging centerlines, less than 150 feet (45.7 m) between the runway holding position markings, and potential difficulty in positioning surface painted holding position signs in the available space.



NOTES:

1. Illustrates perpendicular taxiway centerlines less than 150 feet (45.7 m) (see paragraph 4.3d).
2. Illustrates a curved taxiway centerline between two runway holding position markings with less than 150 feet (45.7 m) along the taxiway centerline (see paragraph 4.3d).
3. Illustrates a converging taxiway centerline curving toward two runway holding positions.

Figure C - 12. Intersection of Multi-Taxiway Centerlines with Less than 150 Feet (45.7 m) Between Taxiways

e. **Two Taxiway Centerlines Intersecting a Runway Holding Position Marking.** Figure C-13 illustrates an angled runway holding position marking that is intersected by two taxiway centerlines.

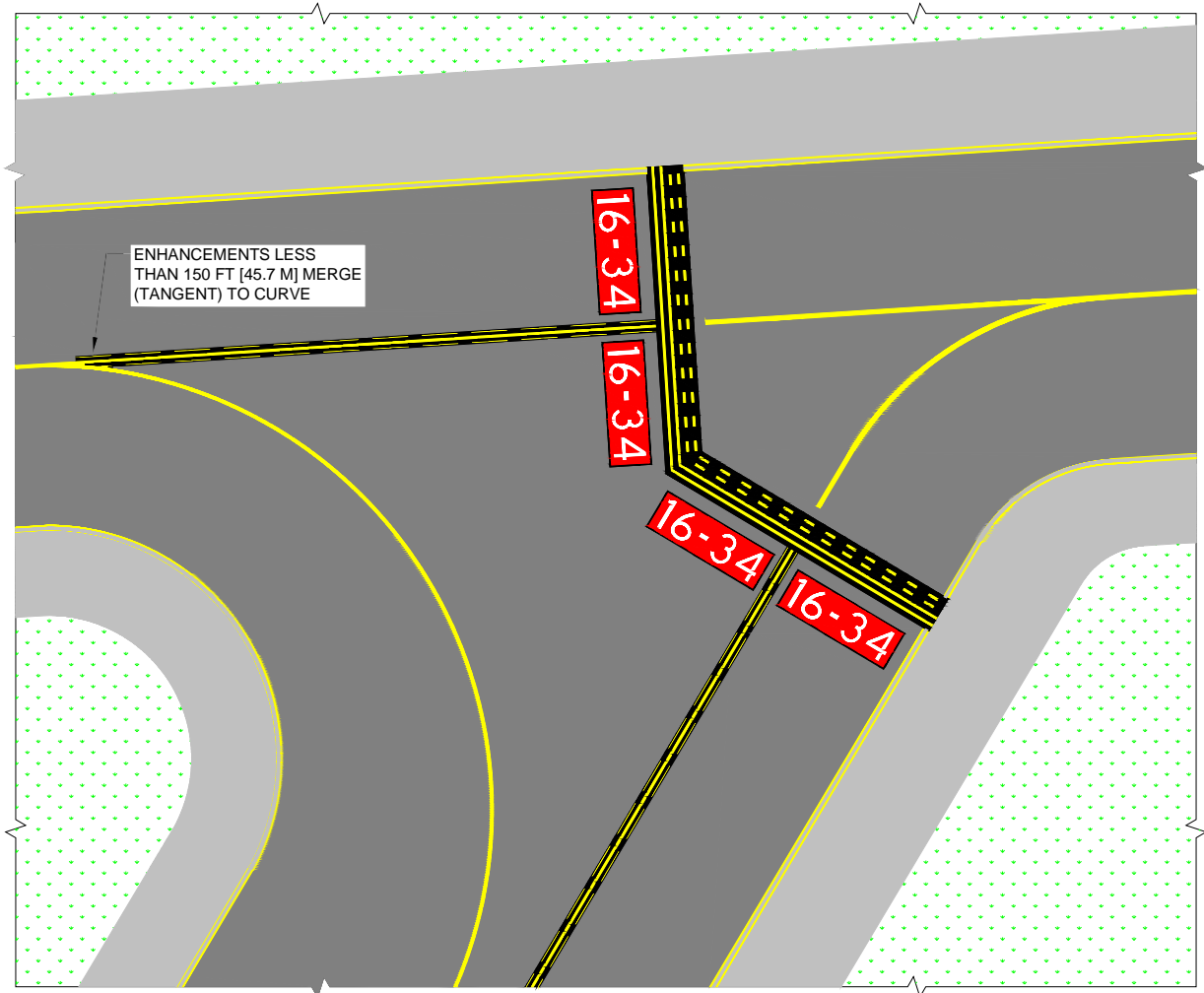


Figure C - 13. Two Taxiway Centerlines Intersecting a Runway Holding Position Marking

f. Intersection of Stub Taxiway and Runway. Figure C-14 illustrates a solution for a stub taxiway that is less than 150 feet (45.7 m) long, with a 90-degree turn and angled taxiway shoulder areas. Per paragraph 4.3d, the enhancement terminates 5 feet (1.5 m) from a taxiway/taxiway intersection.

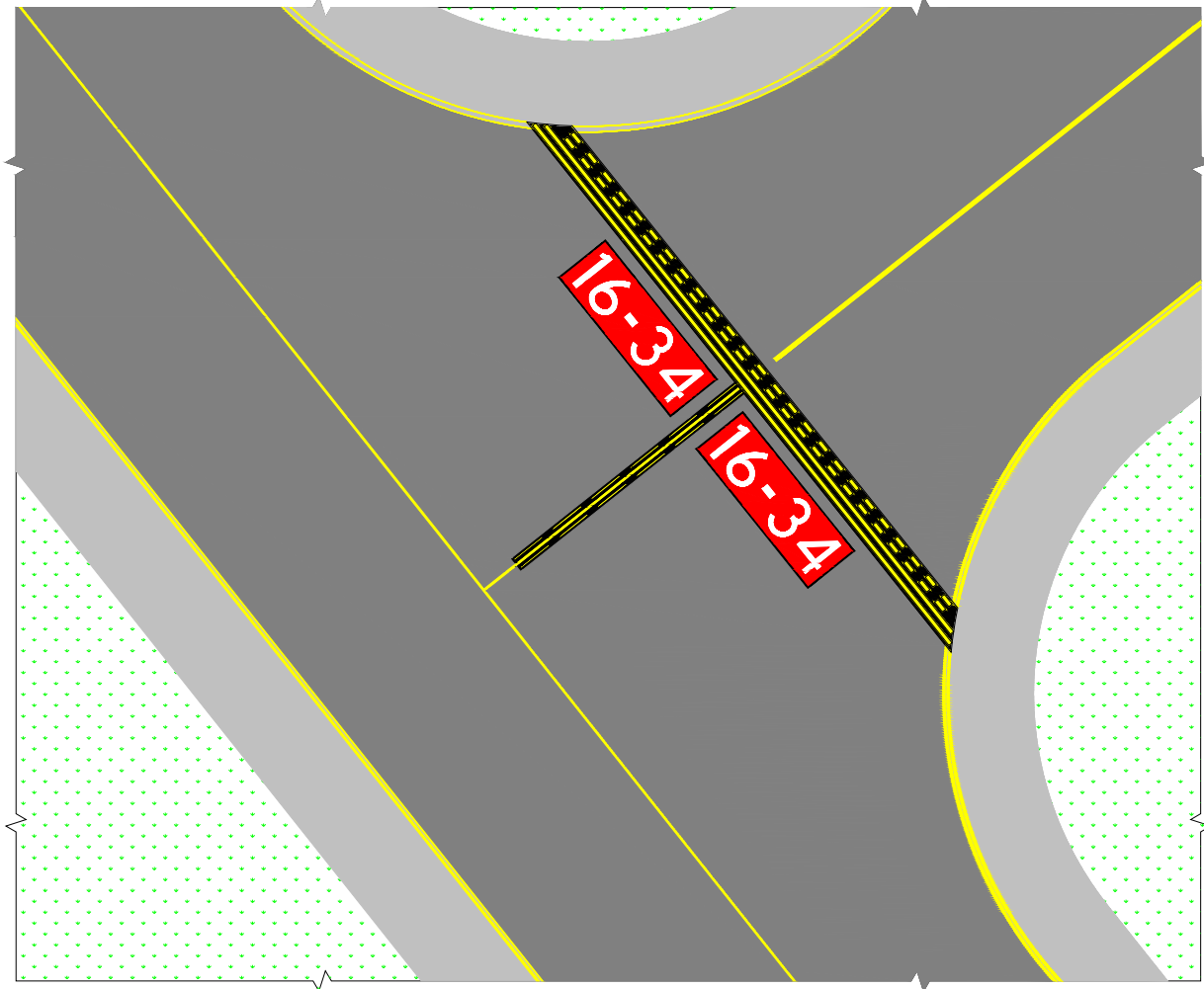
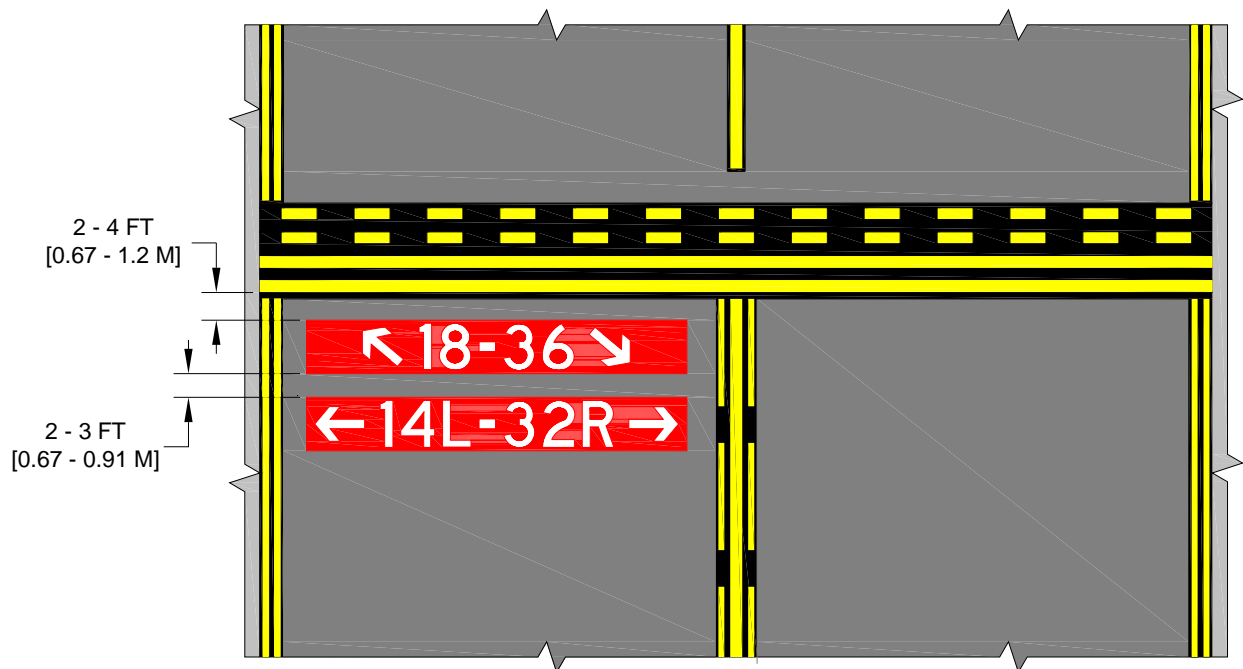


Figure C - 14. Intersection of Stub Taxiway and Runway



NOTES:

1. STACKED SURFACE PAINTED HOLDING POSITION SIGNS FOR NARROW TAXIWAYS - ONLY TO BE USED PER PARAGRAPH 4.5 (d)(1)(ii).
2. THE RECOMMENDED ORDER OF APPEARANCE FOLLOWS:
 - (A) IF THE "STACKED" SURFACE PAINTED HOLDING POSITION SIGNS ARE FOR A TAXIWAY THAT CLEARLY ACCESSES ONE RUNWAY (FOR EXAMPLE, RWY 14L/32R) BEFORE ANOTHER RUNWAY (RWY 18/36), THEN THE ORDER OF APPEARANCE IS FROM "BOTTOM UP" AS SHOWN ABOVE.
 - (B) IF THE "STACKED" SURFACE PAINTED HOLDING POSITION SIGNS ARE FOR A TAXIWAY THAT EQUALLY OFFERS ACCESS TO TWO OR MORE RUNWAYS, THEN FOLLOW A "CLOCKWISE" ORDER OF APPEARANCE AS VIEWED FOR THE HOLDING POSITION. HENCE, THE BOTTOM SURFACE PAINTED HOLDING POSITION SIGN IS THE FIRST RUNWAY AS VIEWED FROM THE HOLDING POSITION. THIS PRACTICE FOLLOWS THE SIGNAGE CONVENTION.

Figure C - 15. Narrow Taxiway Stacked Surface Painted Holding Position Sign

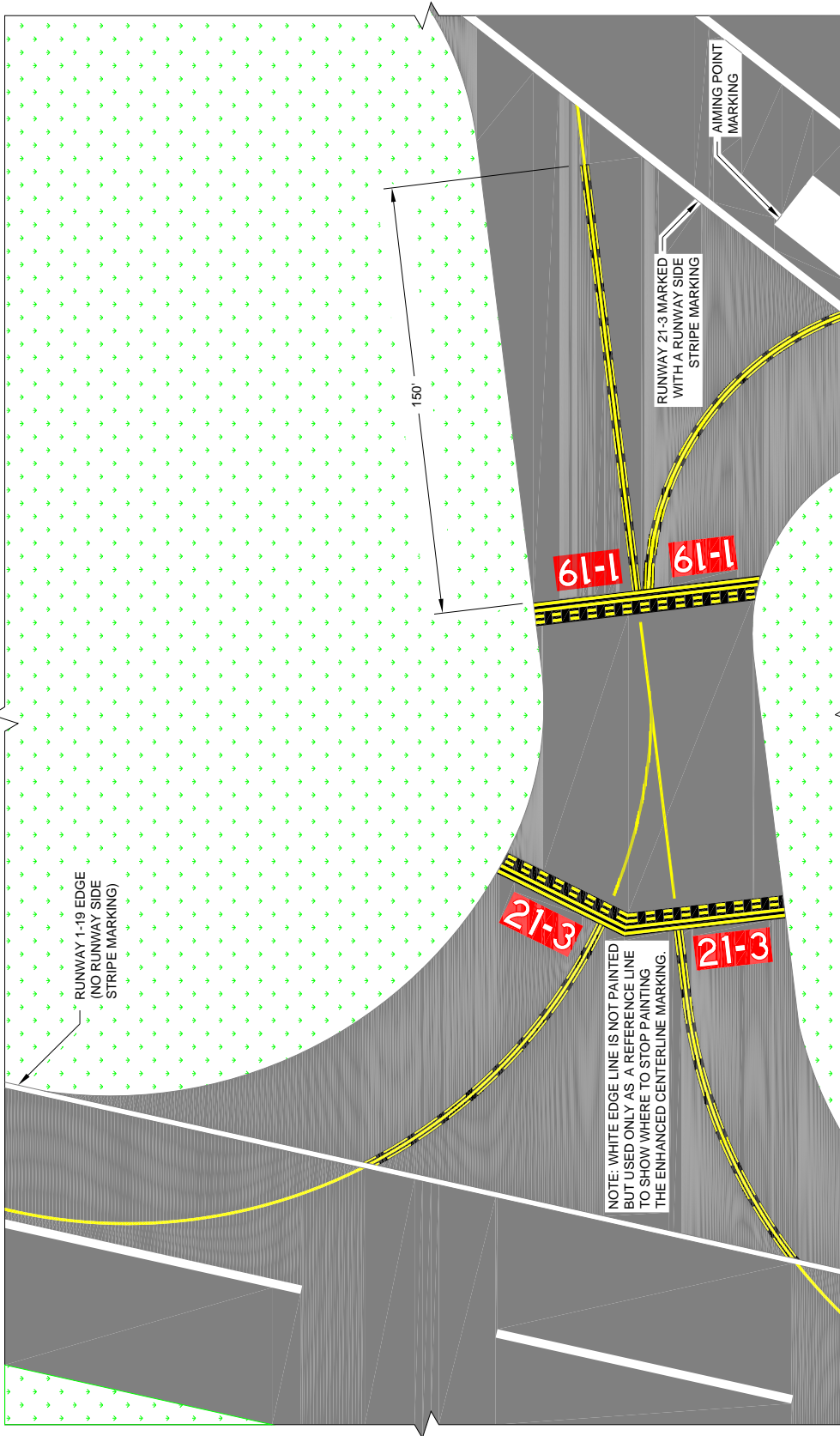


Figure C - 16. Enhanced Taxiway Centerlines When a Taxiway Connects Closely Spaced Runways

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