

Instructions for the use of 5300-13 Taxiway Design Tool for High Speed Exits

The Excel spreadsheet, “5300-13 Taxiway Design Tool for High Speed Exits” may be used for the design of high speed runway exits where the existing runway to taxiway separation is not adequate to accommodate a 30 degree initial turn followed by a 150 degree turn to reverse direction on the parallel taxiway while keeping the nose gear steering angle to no more than 50 degrees. The calculations are in accordance with AC 150/5300-13A Change 1. The initial delta, the maximum fuselage angle¹, the total length of the required taper leading out of a turn from the point of intersection (P.I.) (L-1 + L-2 + L-3 in AC 150/5300-13), and the length of the taper beyond the point of tangency (P.T.) are calculated.

1. Use the dropdown list in cell B2 to choose the TDG. The Cockpit to Main Gear Distance (CMG), Main Gear Width (MGW), Taxiway Edge Safety Margin (TESM), and Taxiway Width (W) are shown in cells B3 – B7.
2. Enter the runway to taxiway separation in cell B9.
3. The exit radius should be maintained at 1500 feet, and the exit angle at 30 degrees. These values may be changed by the user, but the use of nonstandard values is subject to FAA review.
4. In column A, starting in row 23, enter any range of turn radii for the second turn desired, incremented as desired, down to row 155.
5. Read the initial delta in column AC and the associated fuselage angle in column BB.
6. Read the taper length required beyond the P.T. in column BH.
7. Read the total of L-1 + L-2 + L-3 in column BM.

Example: To determine the design of a high speed exit for TDG-6 where the existing runway to taxiway separation is 400 feet, enter “400” in cell B9. Reading down columns AC and BB show that an initial delta of 24.5 degrees followed by a $(180-24.5=)$ 155.5 degree turn with a radius of 153 feet results in a maximum fuselage angle of 49.8 degrees.

¹ When the nose gear is aft of the cockpit, the nose gear steering angle will be slightly less than the fuselage angle. Use the fuselage angle as a slightly conservative design factor.

If you note any inconsistencies in the spreadsheet or have suggestions for improvement, please contact: Khalil.Kodsi@faa.gov

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