

- Step 7: Determine the rainfall intensity (i) based on the longest time identified in Step 6 and place in Col. 8. Refer to Chapter 6 for Intensity-Duration-Frequency information.
- Step 8: Multiply the rainfall intensity (i) established in Col. 8 with the accumulated CA in Col. 6 to determine the design discharge (Q) in Col. 9.
- Step 9: Determine the minimum conduit slope and diameter and enter in Col. 13 and 14. Compute the invert elevations of the upstream and downstream ends of the conduit. If the designer finds it more convenient to work in percent (ft/100 ft.) as opposed to ft/ft, the unit designation for Col. 13 should reflect percent.
- Step 10: Determine pipe length by measuring the out-to-out distance between structures from the plan sheet and enter in Col. 12.
- Step 11: With diameter and slope determined, invert elevations for the upstream and downstream ends of a pipe segment are entered in Col. 10 and 11. If possible, the invert elevations should be based on either the minimum depth of the inlet or the minimum cover for the conduit. The minimum slope of the conduit should approximate the slope of the road grade if the conduit is a trunk line or parallel to the highway.
- Step 12: Determine the capacity of the conduit using Manning's Equation and enter in Col. 15. The calculated pipe capacity should exceed the design discharge (Col. 9) identified in Step 8. If the capacity is too low, choose a larger conduit diameter or increase the slope and recompute the capacity.
- Step 13: Determine the velocity of flow in the pipe based on the design discharge and actual pipe slope and enter in Col. 16. Partial flow velocity should be used if pipe is not flowing full.
- Step 14: Determine the
flow time through the conduit by dividing the conduit length Col. 17 with the velocity (Col. 16) and enter in Col. 17. Be careful to ensure consistent time units.
- Step 15: Add the travel time through the pipe to the inlet time used in Col. 7 and note this value for possible use in Step 6 for the next conduit run downstream. Determine the time of concentration for the next downstream inlet.
- Step 16: Repeat Steps 1 to 13 for subsequent conduit runs downstream.

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