

Chapter 13

Intersection and Interchange Details/Layouts

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Chapter 13

Intersection and Interchange Details/Layouts

13.1 General

These sheets provide layouts and details for intersections and interchanges, with consideration for turning and weaving movements of vehicular traffic. For a safe and efficient roadway system (including provisions for bicycles and pedestrians), these areas must be designed with special attention to channelization, turning movements, signalization, drainage and vertical alignment. Explicitly show the various design details for accurate construction.

Intersection and interchange layout sheets must show all necessary details and geometric controls/access management features, including channelization, tapers, turn lanes, special drainage, and grading. Prepare the sheets on a standard plan format using a scale large enough to show details clearly and legibly.

13.2 Intersections

Show intersection details on separate plan sheet format if they cannot be shown clearly on the plan-profile sheet format.

In cases of simple, nonsignalized intersections covering relatively small areas, regular plan-profile format may be used. Place the intersection layout, using an appropriate scale, in the plan portion, and the necessary profile grades in the profile portion.

For larger, more complicated intersections involving channelization, signalization or tapered connections, place the layout on a standard plan format. Match lines should be used when more than one sheet is required.

Present the profiles separately on a grid format. (See **Chapter 11** of this Volume).

Existing topography need not be shown on these details if it is shown elsewhere in the plans. Information given is generally the same as in the plan portion. Include pavement edges, R/W lines, curb and gutter, channelizing and median curbs, driveways, drainage structures, pavement dimensions, radii, and appropriate notes.

All intersection layouts must be dimensioned, stationed adequately, and must include all pertinent construction notes and alignment data. Provide design speed data when appropriate. Check widths of turning lanes and turning paths for possible encroachments or conflicts.

Include a north arrow and scale at a point of maximum visibility on the plan. Use a scale that is sufficient to cover all necessary details, preferably 1" = 40'. Do not use a scale smaller than 1" = 50'.

13.3 Interchanges

13.3.1 Geometric Layout

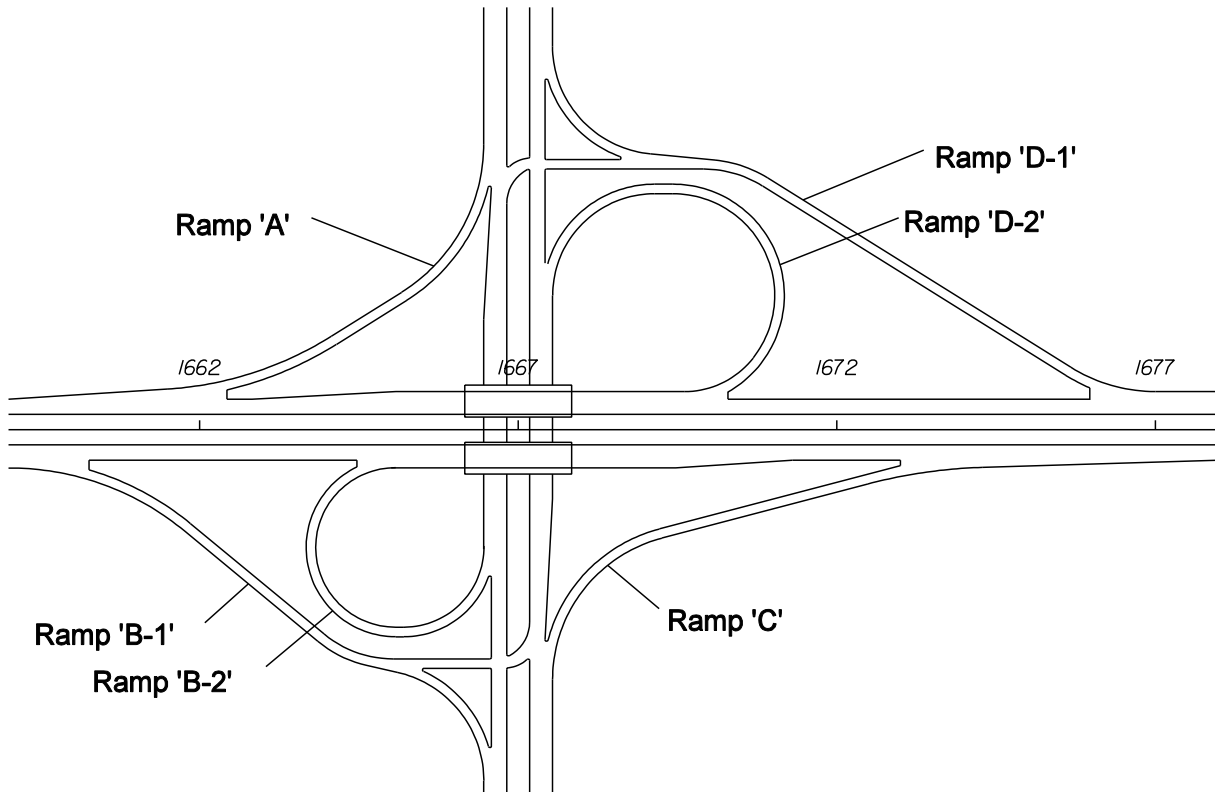
Prepare interchange layouts on a standard plan format. Place the entire interchange on one sheet when possible, using a scale not smaller than 1" = 400'. In cases of large cloverleaf or directional interchanges, more than one sheet may be required. Appropriate match lines must be shown.

Dimension and station layouts with all alignment data and construction notes included. Assign all curves a number and curve data presented in a tabular form. It is preferred that the tabular curve and coordinate data be placed on the same sheet as the interchange layout.

Identify interchange ramps by the use of letters or a combination of letters and numbers. The recommended practice for assigning ramp names is as follows:

1. Ramps in the first left quadrant along mainline stationing should be assigned first. Name assignments progress in a counterclockwise direction around the interchange (see **Figure 13.1**). For projects with two or more interchanges, continue name assignments with the next letter and in same counterclockwise direction noted above.
2. Ramp baselines are usually located on the right edge of the pavement with relation to the direction of traffic, and must be clearly indicated. Stationing of ramps should be in the same direction as the project.

Figure 13.1 Interchange Layout



A topographic worksheet for all interchanges is required and will be considered as the preliminary layout of the interchange. Prepare this worksheet on a standard plan format on a scale not smaller than 1" = 400'. Include the following information on the worksheet:

1. All topography, such as existing roads, property lines, utilities, buildings, driveways, etc.
2. Preliminary interchange geometrics and proposed right of way limits.
3. Drainage right of way and easements.
4. Proposed reconstruction of the crossroad, and all access roads and frontage roads within the interchange.
5. Frontage roads should be assigned a unique alpha or numeric designation to avoid confusion with ramp nomenclature.
6. Contours, unless the terrain is relatively flat.
7. Traffic diagram with AADT, DHV, K, D and T values.
8. The length of speed change lanes.

9. Design speed for ramps and crossroads.
10. Proposed bridge limits.
11. Pavement transitions.
12. Limits of construction along the crossroad.

Include the following interchange sheets in the contract plans set:

1. Interchange geometric layout.
2. Interchange drainage map.
3. Interchange topographic map.
4. Interchange cross section pattern sheet.
5. Ramp terminal details.
6. Ramp cross sections.

13.3.2 Ramp Terminal Details

Show details of ramp terminals with mainline and crossroads on separate plan sheets. Do not use a scale smaller than 1" = 50'. Standard scale 1" = 40' is preferred. Show the following details of the terminal:

1. Curve data.
2. Station equality and horizontal tie to mainline or crossroad at critical ramp locations.
3. Turning radii, taper/transition lengths, curb/curb and gutter (if any).
4. Channelization (if any).
5. Ramp and crossroad intersection station and angle.
6. Median nose data (if any).
7. Limits of construction.
8. R/W.
9. Limited Access R/W and fence location.
10. Drainage structures.
11. Spot elevations (as needed).
12. Roadway dimensions.
13. Station pluses and offsets.

13.3.3 Cross Section Pattern Sheet

The cross section pattern sheet shows the entire interchange layout including frontage and access roads, if any, with location and extent of proposed cross sections. This information is of special importance for projects involving new interchanges located in rural, undeveloped areas. Include the following information on the cross section pattern sheet:

1. North arrow and scale.
2. Interchange layout.
3. Access and frontage roads (if any).
4. Centerline construction and baseline survey.
5. Ramp base lines.
6. Stationing along mainline, crossroads, ramps, access and frontage roads.
7. PC and PT points by symbol.
8. Bridge outline.
9. Cross section pattern.

Prepare this sheet on a standard plan format. Use a scale such that the complete interchange is shown on one plan sheet, with care taken to ensure clarity and legibility. Normal scale is 1" = 400'. Place the north arrow and scale at a point of maximum visibility.

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