314 Intersection and Interchange Layout and Details

314.1 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.

Intersection and interchange layout sheets must show details of geometric controls and access management features including:

- Channelization
- Tapers
- Turn lanes
- Special drainage
- Grading

Prepare the sheets on a standard plan format using a scale large enough to show details clearly and legibly.

314.2 Intersections

These sheets are to be titled:

(1) Intersection Layout, or

(2) Intersection Details.

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

In cases of simple, nonsignalized intersections covering relatively small areas, a regular plan-profile sheet may be used. Use an appropriate scale to place the intersection layout in the plan portion and the profile grades in the profile portion.

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

Place the profiles separately on a grid format. Existing topography need not be shown on these details if it is shown elsewhere in the plans. Refer to ***FDM 313*** for additional information on displaying profiles on grid format.

Information in the plan and profile portions of these sheets typically includes:

- Pavement edges
- R/W lines
- Curb and gutter
- Channelizing and median curbs
- Driveways
- Sidewalks
- Drainage structures
- Pavement dimensions
- Radii
- Appropriate notes

Intersection layouts must be dimensioned, stationed, and include 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 sheet. Use a scale that is sufficient to cover all necessary details, preferably 1" = 40'. Do not us a scale smaller than 1" = 50'.

314.3 Interchanges

These sheets are to be titled:

(1) Interchange Layout,

(2) Interchange Drainage Map,

(3) Interchange Topographic Map,

(4) Interchange Cross Section Pattern,

(5) Ramp Terminal Details, or

(6) Ramp Cross Sections.

314.3.1 Geometric Layout

Prepare the Interchange Layout sheet on a standard plan sheet. Place the entire interchange on one sheet when possible, using a scale no smaller than 1" = 400'. In cases of large cloverleaf or directional interchanges, more than one sheet may be required. Show appropriate match lines.

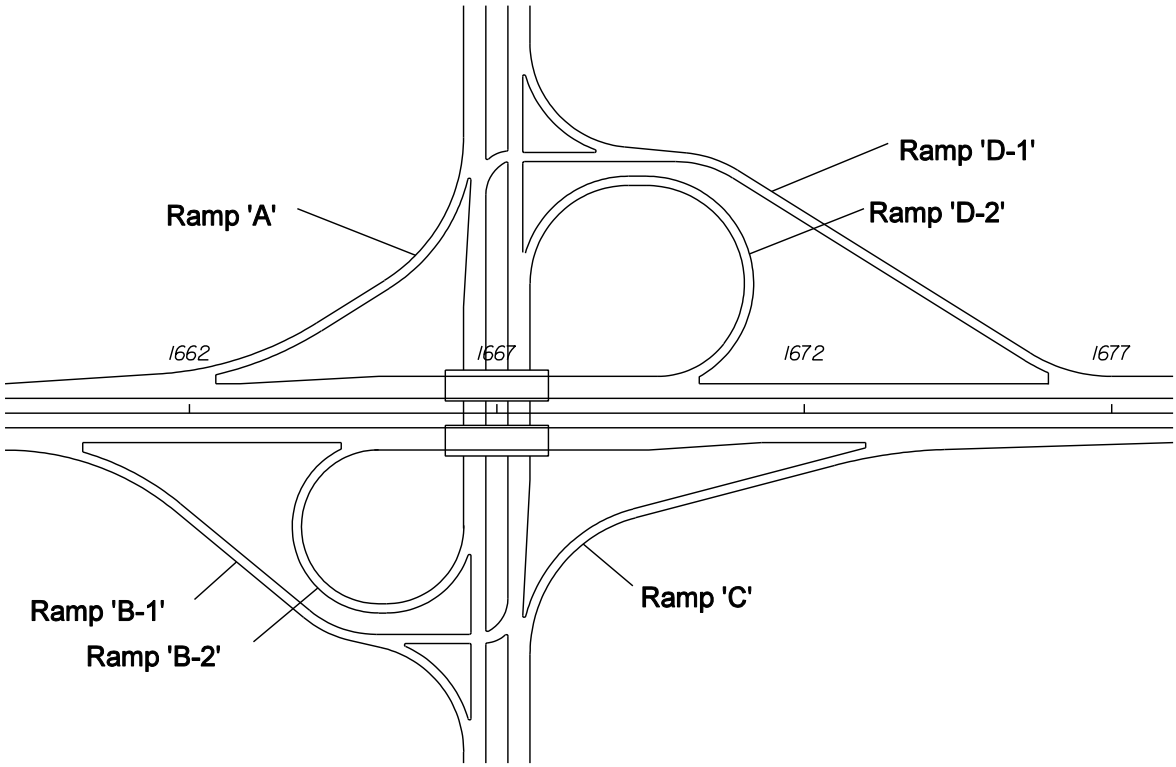
Dimension and station layouts and also include alignment data and construction notes. Assign each curve a number and present curve data in a tabular form. The tabular curve and coordinate data should be placed on the same sheet as the interchange layout.

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 314.3.1***). 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 typically located on the right edge of the pavement with respect to the direction of traffic, and must be clearly indicated. Stationing of ramps should be in the same direction as the project.

Figure 314.3.1 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 sheet using a scale no smaller than 1" = 400'. Include the following information on the worksheet:

(1) All topography, such as existing roads, property lines, utilities, buildings, driveways.

(2) Preliminary interchange geometrics and proposed R/W limits.

(3) Drainage R/W and easements.

(4) Proposed reconstruction of the crossroad, and 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.

314.3.2 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'. A scale of 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.

314.3.3 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. 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 the Cross Section Pattern sheet on a standard plan sheet. Use a scale such that the complete interchange is clearly and legibly shown on one plan sheet. A scale of 1" = 400' is preferred. Place the north arrow and scale at a point of maximum visibility.