CHAPTER 4: PLAN DEVELOPMENT

4.1 GENERAL

Pavement marking plans are prepared using the most recent alignment plans from the roadway design. In some cases, the sign and pavement marking plans can be combined when clarity of the design work can be maintained. The pavement marking plans may include pavement markings, markers, object markers and delineators. The pavement marking design must meet the requirements as set forth in the MUTCD.

4.2 PAVEMENT MARKING DESIGN PROCESS

The pavement marking design process is a sequence of design steps that build on each other to produce a set of pavement marking plans. The following are design steps for producing a pavement marking plan. An example of a pavement marking plan sheet is provided in Appendix IIIA–3. The plan sheet illustrates how to label the marking, markers and delineators.

Step 1 – Prepare Base Plans

Prepare the base plans in accordance with the VDOT CADD Manual Standards.

- Obtain the most recent roadway alignment plans
- Retain coordinates within CADD file
- Check CADD file(s) for corrupt elements
- Show only “Finished” roadway elements within the paved roadway areas, excluding underground utilities and drainage

“Finished” roadway elements are defined as the combined existing and proposed roadway surface features, such as curb lines, roadway edge of pavement, sidewalks, curb ramps, etc. that will be in place when the project is complete. Existing curb lines and roadway features that are to be removed or relocated during construction are not to be shown in the base plans or pavement marking plan sheets.

The base plan sheet will require the following information (at a minimum):

- North arrow
- Graphic scale, typically 1”=50’
- Metric logo, if applicable
- Roadway names
- Finished roadway elements (to scale)
- Project No. Blocks
- Matchlines
- Centerlines (Stationing)

A detailed list of design information to be included in the base plans for pavement marking construction plans can be found in Appendix IIIB-2.

Step 2 – Review the Typical Section

Determine the number of lanes and the widths of each lane from the typical section plan sheets. The typical section provides information regarding special use lanes and where each lane is located relative to other roadway features, such as medians, curbs and centerline of roadway. The typical section also provides the pavement surface type

used for that section. The designer will use this information to determine and specify the appropriate pavement marking material for the surface type.

Step 3 – Set the Left Edge Line

The pavement marking design usually begins with setting the left edge line within the stationing of the typical section. Identify the width and color of lane line on the plan sheet.

Step 4 – Set the Traveled Way Lane Lines

Offset the lane lines from the left edge line based on the lane widths for each lane shown in the typical section. Determine the lane line type (skip lines, solid lane lines, mini-skip, etc.). Identify the width and color of lane line on the plan sheet.

Step 5 – Set the Right Edge Line

Offset the right edge line from the right most travel lane line as depicted in the typical section. Identify the width and color of lane line on the plan sheet.

Step 6 – Develop Pavement Markings for Roadway Alignment

Developing pavement markings for roadway alignment may require coordination with the sign design. Roadway transitions occur between typical sections and therefore signs and pavement markings must reflect the pending change in the typical section. Pavement markings that identify transitions, such as lane drops or exit only lanes, acceleration lanes, deceleration lanes, and lane reduction transitions, may have to begin well before the change in the typical section. Coordinating with the sign design will assist in establishing where and what types of lane lines are necessary. Illustrate the lane line type and identify the width and color on the plan sheet.

Step 7 – Illustrate Pavement Markings for Specific Needs

Illustrate pavement marking for areas that require:

- Gore Markings
- Crosswalks
- Intersections (Signalized and Unsignalized)
- School Zones and Railroad Crossings
- Traverse Markings
- Pavement Marking Message

Step 8 – Develop the Pavement Marker Layout

Locate and identify the type and color of pavement markers on the pavement marking plan sheet.

Step 9 – Develop the Object Marker Layout

Identify roadway features that require object markers. Illustrate where the object markers are to be located and label them on the pavement marking plans.

Step 10 – Develop the Delineation Layout

Identify where the roadway geometry requires roadside delineators. Illustrate where the delineators are to be located and label them on the pavement marking plans.

Step 11 – Develop Pavement Marking Details Sheet

A pavement marking detail sheet is developed to better illustrate the location of the markings relative to the typical section of the roadway, as shown in Appendix IIIA-2.

4.3 PREPARATION OF PLAN SET

An example of a pavement marking construction plan set is provided in Appendix IIIA-1, Appendix IIIA-2 and Appendix IIIA-3. The following plan sheets are presented in the proper sequence to produce a pavement marking plan set.

- Summary Sheet
  - An example of a Pavement Marking Summary Sheet is provided in Appendix IIIA-1.

- Detail Sheet
  - An example of a Pavement Marking Detail Sheet is provided in Appendix IIIA-2.
  - Additional detail may be necessary to illustrate the placement of the pavement markings, pavement markers, object markers or delineation.

- Plan Sheet
  - An example of the Plan Sheet is provided in Appendix IIIA-3.
  - Plan sheets will include the following (at a minimum):

    - North arrow
    - Scale, typically 1”=50’
    - Metric logo, if applicable
    - Roadway names
    - Pavement Marking Legend
    - Finished roadway elements (to scale)
    - Pavement Markings
    - Pavement Markers, if applicable
    - Object Markers, if applicable
    - Delineators, if applicable
    - Pavement Message Markings, (if applicable)