



# Plan and Profile Sheets

Design Manual

Chapter 1

General Information

Originally Issued: 02-04-11

Revised: 09-20-12

This section contains information regarding plan and profile sheets. These sheets usually show overhead (plan) and side (profile) views. Plan and Profile sheets are intended to convey a general overview of the project by showing how the project interacts with existing features. They contain information concerning alignments, profiles, and ditching. The general appearance of the plan and profile sheets should follow the guidelines set in Section [21E-4](#). The following information is normally found in the plan and profile sheet portions of a plan.

## Plan and Profile Legend and Symbol Information Sheet

Any project that contains color plan and profile sheets must include a color Plan and Profile Legend and Symbol Information Sheet as the first color sheet in the plan. This will commonly be sheet D.1. For information pertaining to the Plan and Profile Legend and Symbol Information Sheet refer to Section [1F-5a](#). For directions on producing legend and symbol information sheets refer to Section [21A-52](#).

## Plan and Profile Sheeting

Plan and profile sheets can be created by browsing to *Applications > Road > Plans Preparation > Plan/Profile Sheet Composition*. Refer to Section [21B-4](#) for further guidance and sheeting instructions.

## Plan View

Items to be displayed in Plan View include:

- **Alignments and Stationing**
  - **D, M, and Q Sheets:** All alignments and tic marks, along with mainline stationing should be present on each sheet. Side road, ramp, and detour stationing should not be displayed.
  - **E, F, and K Sheets:** Display stationing for the alignment listed in the title block only. All alignments and tic marks should be present on each sheet.
- **Scale**

A scale block should be located near the midpoint of the bottom of the plan portion of each sheet, where possible.
- **North Arrow**

A north arrow should be located in the top portion of the plan sheet between the midpoint and upper right corner of each sheet, where possible.
- **Title Block**

If the alignment represented on the sheet is not the mainline roadway of the project, a title block should be used. They are required on D sheets only when there is a split profile. The title block should be located in the lower right corner of the plan portion of each sheet. It should reference the route and, if applicable, the direction of travel.
- **Township/Section/Range**

Township, section, and range information should be provided on each plan sheet.
- **Existing Features**

Existing topographical features should be provided on each plan sheet.
- **Aerial Imagery**

Aerial imagery may be included in the plan through D5 to serve as a design aid. Final plans may include aerial imagery for all plan sheets only if the image provides critical information which is otherwise absent in the photogrammetric topography.

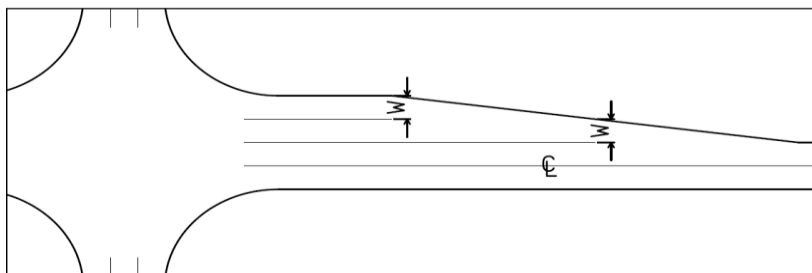
- **Shading**

Shading of the grading surface, the proposed granular surface, the proposed grade/pave surface, the proposed pavement surface, and the temporary pavement surface should be contained within the pavement edge lines and should be shown only where the full subgrade has been developed. Bridges and entrances should be shaded only if they will be constructed in the project.

**NOTE:** Sidewalk should be shaded in the same color as on the S sheets.

- **Lane Lines**

Lane lines should be shown, but terminated within the returns of intersections as not to cross with any other lane lines. Lane lines should also only be presented after the lane width is fully developed. Refer to the illustration in Figure 1 for clarification.



**Figure 1:** Proper Lane Line Development

- **Pavement Edge Lines**

Pavement edge lines should be present on each sheet.

- **Ground Line Intercept**

The ground line intercept should be shown for all work types.

- **Structures**

Proposed and existing structures should be present on each sheet.

- **Entrances**

Proposed and existing entrances should be present on each sheet.

- **Right-of-Way**

Proposed right-of-way lines, proposed right-of-way symbols, and section lines should be present on each sheet and identified on the legend sheet. Property lines and their symbols should not be displayed. Right-of-way lines should only be included if the limits are known; do not assume the right-of-way is consistent with the fence line.

- **Utilities**

Utilities should be shown on the plan portion of each sheet and identified on the legend sheet.

- **Railroad Crossings**

Show all railroad crossings within or immediately adjacent to the project limits, including the railroad property lines and the name of the railroad company. Include this information anytime the contractor will be required to gain access or perform work on the railroad right-of-way or within 25 feet of the centerline of the outermost railroad track.

- **Restricted Areas**

If any environmentally or culturally sensitive areas are located outside the ROW, the contractor must be made aware of the location while maintaining confidentiality to the nature of the restricted area as required by Iowa code. To do this, the area should be hatched in red and a special note should be highlighted in yellow on the plan sheet. The designer will be provided the note and location of hatching by the Office of Location and Environment.

## Other Project Specific Information

Project specific information should be shown on the plan portion of the appropriate sheet and identified on the legend sheet or labeled.

Items to be labeled in Plan View include:

- **Begin/End Project**  
Begin/End Project designates the outermost limits of the project, excluding areas necessary for traffic control, and should be labeled using **D & C Manager**. *Design Files > Road Design > (ML, SR, DET, INCH, INSC, RMP, STG) > Plan View > Notes > Begin/End Note*. The Begin/End Project may not necessarily require labeling in the D Sheets. For example, it is not necessary to create additional D sheets to label the Begin/End Project to include crossovers, since this information is labeled on the Location Map Sheet. If the Begin/End Project does not coincide exactly with the work done (for example, the areas tying into existing ground during grading), conservatively round to the nearest 10 feet to determine the project limits.
- **Begin/End Construction**  
Begin/End Construction designates the outermost limits of construction for routes intersecting the mainline of the project (E and F sheets), excluding areas necessary for traffic control, and should be labeled using **D & C Manager**. *Design Files > Road Design > (ML, SR, DET, INCH, INSC, RMP, STG) > Plan View > Notes > Begin/End Note*.
- **Begin/Stop/Resume/End Pavement Types**  
Begin/Stop/Resume/End Pavement Types should be labeled using **D & C Manager**. *Design Files > Road Design > (ML, SR, DET, INCH, INSC, RMP, STG) > Plan View > Notes > Begin/End Note*. The following work types are examples that should be designated within the plan: Paving, Resurfacing, Milling and Resurfacing, and Widening and Resurfacing.
- **Roadways**  
Roadways should be labeled using **D & C Manager**. *Design Files > Road Design > (ML, SR, DET, INCH, INSC, RMP, STG) > Plan View > Text > Roadway Label*.
- **Horizontal Curve Information**  
Horizontal curve information should be labeled using **D & C Manager** per Section [2A-1](#). *Design Files > Road Design > (ML, SR, DET, INCH, INSC, RMP, STG) > Plan View > COGO Alignments > English Horizontal Alignments*
- **Station Equations**  
Station equations should be labeled using **Plan View Labeler** per Section [1F-12b](#).
- **Description of Structures**  
Structures should be labeled using **D & C Manager**. *Design Files > Road Design > (ML, SR, DET, INCH, INSC, RMP, STG) > Plan View > Pipes and Culverts > Culvert Note*. Roadway pipe text should be located in the top and bottom portions of the plan view. (Left side pipes should be labeled at the top and right side pipes should be labeled at the bottom.) If pipes have been installed in a previous stage, the pipe text should look similar to survey data. The text will print green and the word “install” should be deleted. For complex projects additional information, such as ‘Installed with (*paren*),’ may be beneficial. All existing structures shall be labeled as to their disposition. Where applicable, design numbers should be included for structures.
- **Location of Dikes and Types**  
Dikes should be labeled using **D & C Manager**. *Design Files > Road Design > (ML, SR, DET, INCH, INSC, RMP, STG) > Plan View > Cells > Dikes*. If dikes have been installed in a previous stage, the dike text should look similar to survey data. The text will print green and the word “prop.” should be deleted.
- **Entrance Location and Type**  
Entrances should be labeled using **D & C Manager**. *Design Files > Road Design > (ML, SR, DET, INCH, INSC, RMP, STG) > Plan View > Entrance*. Entrances are to be labeled to the nearest foot. If an entrance pipe is present, it should be labeled immediately below the entrance type labeling. If entrances/entrance pipes have been installed in a previous stage, the entrance text should look similar to survey data. The text will print green and the word “prop.” should be deleted.

- **Borrows**  
A label designating the general location of borrows should be shown.
- **Roadway Intersection Points**  
Roadway intersection points should be labeled using **Plan View Labeler**. Any location where an alignment relates to the mainline should be labeled according to Section [1F-12b](#).
- **Special Instructions**  
Project specific special instructions may be put on D sheets, but must also be thoroughly explained in the Estimate Reference Notes.

**NOTE:** Any items that cannot be found in the legend must be labeled.

## Profile View

Items to be displayed in Profile View include:

- **Profile and Stationing**  
Profile, stationing, and profile grade elevations at 25-foot intervals should be present on each sheet. If portions of the profile are not to be constructed in the current project, then the profile in those areas should be identified by a dashed line.
- **Entrances**  
Proposed rural entrance profiles should be located in the profile view at the station where they occur.
- **Ditch Grade Information**  
Left, median, and right ditch grades should be shown on each sheet and drawn using **D & C Manager**. *Design Files > Road Design > (ML, SR, DET, INCH, INSC, RMP, STG) > Profile View > Ditch Grade Tool*. Ditching should be accurate to the current construction or not shown at all (this includes temporary ditching).

Items to be labeled in Profile View include:

- **Begin/End Project**  
Begin/End Project locations should be labeled using **Profile Labeler**. The Begin/End Project locations need only be labeled if they relate directly to the proposed profile. If the Begin/End project does not directly correspond with the pavement type, conservatively round to the nearest 10 feet to determine the project limits, as such the elevation should not be labeled since this location is approximated.
- **Begin/Stop/Resume/End Pavement Types**  
Begin/Stop/Resume/End Pavement Types should be labeled using **Profile Labeler**.
- **Vertical Curve Information**  
Vertical curve information should be labeled using **D & C Manager** per Section [2B-1](#). *Design Files > Road Design > (ML, SR, DET, INCH, INSC, RMP, STG) > Profile View > Roadway > COGO Profiles*.
- **Station Equations**  
Station equations should be labeled using **Profile Labeler**.
- **Entrances**  
Proposed entrance profile grades should be labeled using text size 10 (for 100 scale).
- **Ditch Bar Graph**  
The ditch bar graph should be constructed using **D & C Manager**. *Design Files > Road Design > (ML, SR, DET, INCH, INSC, RMP, STG) > Profile View > Text > Roadway > Bar Graph Text*. If temporary ditching is necessary for the project, it should be identified in the ditch bar graph as such.
- **Hauling Information**  
Hauling information should be located in the top section of the profile view. Text settings should match the parameters in Table 1, excluding justification.

## Examples

[Urban Mainline Plan and Profile Sheet Sample](#)

[Rural Multi-Lane Grading Mainline Plan and Profile Sheet Sample](#)

[Rural Bridge Replacement Sample](#)

# Chronology of Changes to Design Manual Section:

## 001F-005b Plan and Profile Sheets

- |           |   |
|-----------|---|
| 9/20/2012 | Revised<br>Added note block about Sidewalks under Plan View - Shading.  |
| 2/10/2012 | Revised<br>Updated D&C Manager location for culvert labeling tool. Moved 'Sheet and Text Scale' information to Section 1F-1.  |
| 6/30/2011 | Revised<br>The following items have been updated in this section and/or added to the sample sheets:<br>Corrected text settings for various sheet scales, added reference to new shading levels created for grade/pave and temporary pavement shading, incorporated new sidewalk shading levels in the urban sample sheet, updated to show only proposed right-of-way and section lines, clarified begin/end project and begin/end construction labeling requirements, added that portions of the profile not constructed in the current project should be dashed, and added that ditching should be accurate to the current construction. |
| 2/4/2011  | NEW<br>New material describing process for creating D sheets.   |