316 Stormwater Facilities

316.1 General

This chapter discusses the content and requirements for plan sheets relating to stormwater facilities, including the following systems:

- lateral ditches
- outfalls
- retention areas
- detention areas
- mitigation areas

These systems typically require additional R/W or easements.

Mitigation areas are not usually a component of the highway drainage system. However, they may include drainage components.

Drainage components adjacent to the roadway may be shown on the roadway plan-profile sheets as long as they are clear and legible. Drainage components not adjacent to the roadway may require separate plan view sheets. In either case, profile views and cross sections may also be needed.

Plans for drainage components are typically grouped into three categories:

(1) Lateral ditches and outfalls

(2) Retention or detention areas

(3) Mitigation areas

316.2 Lateral Ditches and Outfalls

Prepare lateral ditch plans and profiles on a standard plan-profile sheet using a horizontal scale of 1" = 100'. However, if storm drain construction is proposed for a portion of the ditch, a scale of 1" = 40' or 1" = 50' may be used.

316.2.1 Plan Portion

Orient data in the plan portion so that the lateral ditch or outfall centerline is parallel to the long side of the sheet. Show information in a manner similar to that described in ***FDM 312***.

Show R/W (or easement) alignment data and topography in the plan portion. Tie the alignment of the lateral ditch or outfall to the centerline of construction. Place the north

arrow and scale at a point of maximum visibility, typically in the upper right portion of the plan view.

316.2.2 Profile Portion

Prepare the profile portion in the same manner as described in ***FDM 312***. Show the following information:

- Existing ground line profiles
- High water elevations
- Underground utilities
- Benchmark information
- Elevation datum

Where the lateral ditch and outfall survey baselines do not follow the flow line of the existing ditch or channel, the existing ditch or channel profile must be shown with a broken line and identified.

If storm drain construction is proposed along a lateral ditch or at an outfall, plot the proposed structures on the drainage structures sheets, or in the lateral ditch and outfall profile. Include the following information for the structures shown in the profile:

- Flow line
- Structure numbers
- Pipe or culvert sizes
- Utilities (if applicable)
- Label the normal water elevation of the receiving system.

316.2.3 Typical Section

Include a typical section showing the following:

- Limits of clearing and grubbing
- R/W
- Ditch bottom width
- Side slopes

The typical section does not need to be to scale, but must be dimensionally proportionate. If the width of proposed clearing and grubbing is variable, note the various widths and their respective station limits below the typical section.

316.2.4 Ditch Cross Sections

Lateral ditch cross section sheets are included in the plans. These sheets include the following:

- R/W
- Earthwork
- Limits of clearing and grubbing

Prepare lateral ditch cross sections in the same manner as described in ***FDM 319***. A horizontal scale of 1” = 10’ is preferred. Use a vertical scale of 1" = 10'.

Two or more columns of ditch cross sections may be placed on one sheet. Cross section stationing must progress from the bottom to the top of the sheet and multiple columns must be placed from the left to right.

Soil surveys are typically performed along the lateral ditch only when a large amount of material is expected to be excavated.

316.3 Retention or Detention Areas

316.3.1 Pond Detail Sheet

The retention or detention pond, including the outlet structure, is usually the end point of the drainage system for a particular project. The retention or detention pond detail sheet shows the pond in plan view and includes station and offset ties to the project centerline of construction. The plan view also includes the following:

(1) Locations of pond sections

(2) Side slopes and base dimensions

(3) Bottom and top elevations

(4) Location of maintenance berm

(5) Fence and gate locations

(6) R/W

(7) Pond drainage structures with structure numbers

(8) Soil boring locations

(9) Any other necessary data pertaining to the pond

Include a minimum of two sections, taken in directions perpendicular to each other. These pond sections include the following:

- Bottom width and elevation
- Side slopes
- Normal water depth (if applicable)
- Soil borings

316.3.2 Typical Section

A typical section is required when the pond sections do not represent the *typical* design features of the pond. The following is a list of appropriate information to be shown on the typical section:

- Limits of clearing and grubbing
- Side slopes
- Bottom and top elevations
- Details of maintenance berm
- Fence location
- R/W
- Water level information
- Vegetation requirements

The typical section does not need to be to scale, but must be dimensionally proportionate. It should be shown on the pond detail sheet, if room allows, or on a separate sheet when necessary.

316.3.3 Pond Cross Sections

Prepare pond cross sections in the same manner as described in ***FDM 319***. A horizontal scale of 1” = 10’ is preferred. Use a vertical scale of 1" = 10'.

If material is to be excavated from the pond, plot the soil borings on the cross sections.

316.4 Mitigation Areas

If construction details for mitigation areas are included in the plans, follow the requirements for retention or detention areas.