INTRODUCTION

Pipe networks are integral to a site-design solution. The piping system’s complexity can vary from simple culverts to several storm and sanitary networks that service a residential area. Civil 3D creates plan, profile, section, and model network components. A pipe network can be a part of a roadway corridor’s sample line group or can be a network of trunk lines and laterals. A pipe network can create profiles that display each segment’s vertical design.

OBJECTIVES

This chapter focuses on the following topics:

- Defining Pipe-Run Specific Settings
- Defining New Pipe-Run Structures
- Defining Pipe Runs
- Editing and Analyzing Pipe-Run Data
- Annotating Pipe Runs in Plan and Profile Views

OVERVIEW

The Ribbon’s Home and Modify, Pipe Networks panel commands create, edit, and annotate pipe and structure networks (see Figure 11.1). The pipe design toolset is in the Pipe Network Creation Tools toolbar (see Figure 11.2). Most piping designs are an interconnected network of trunk and branch lines. A pipe network can have several trunk lines and each trunk line can have any number of branches. The key is to include all of the appropriate trunks and branches with the correct network. You add to a network by editing it. Prospector lists all of the pipes and structures in a pipe network.
The pipe Network Layout Tools toolbar depends on a series of settings and styles. These settings and styles govern the structure type, pipe type and size, inverts, and a host of additional values.

A pipe network does not require an associated alignment. Each network stands on its own. If you want a pipe network alignment and profile, Modify’s Pipe Networks panel’s Launch Pad has tools you can use to create them. Other panel commands place all or a selection of pipes and structures in a profile view.

To edit a network, you select a pipe or structure, press the right mouse button, and from a shortcut menu, select Edit Network. Edit Network also is located in Modify’s Pipe Networks panel or in a Prospector shortcut menu. Edit Network displays the pipe Network Layout Tools toolbar.

When you associate an alignment to a pipe network, you should do so when you start the network’s design (see Figure 11.3). A pipe network can start or end beyond the associated alignment definition. If a pipe run is outside an alignment definition, you may have to edit structure and pipe values to produce correct elevations and slopes.
Pipe network review and editing is graphical and is done in Plan and/or Profile View, in a Pipe Network vista editor, or by editing values in the object’s Properties dialog box. If a pipe network does not have an associated alignment, all editing is done in Plan View or in a panorama.

One issue is the pipe network layer assignment. The Pipe Network’s object layer list defaults to a storm pipe system. When you set the Network parts list to Sanitary Sewer or Storm Sewer, the layer list does not switch; it stays set to the Storm layers. If you switch the parts list, the layers specified in the Create Pipe Network dialog box must be changed.

An alternative to this layer switching is to define generic pipe and structure layers in the Object Layer list. The differentiation of pipe network types is done by appending the network name to the pipe and structure object layers. This allows all network types to use generic object layers and you no longer need to switch layer names each time you define a pipe network. To display structures and pipes with different colors, define each parts list using the structures and pipes object layers, but assigning different colors to each system type.

When you select a pipe or structure and press the right mouse button, a shortcut menu appears. The shortcut menu on the left side of Figure 11.4 shows the available options for selecting pipe, and the shortcut menu on the right side shows the options available for selecting a structure.
When you graphically edit a pipe or structure in Plan View, Civil 3D allows you to move them, disconnect them from the network, change their style, swap to a new part, or edit the network in a panorama (see Figure 11.4). When you are manipulating a pipe’s grip, by moving it away from a structure, the pipe is disconnected from the structure. When you are moving the pipe back to the structure, the icon, attach to structure, must appear before you select and reattach the pipe. If you are selecting a structure with connected pipe, by moving it, you relocate the pipes.

In Plan View, when you are breaking a pipe to add a structure or pipe, a break pipe icon is displayed and indicates the point at which the new structure or pipe attaches to the network.

When you are editing a pipe network in Profile View, Civil 3D imports selected pipes and structures or the entire network into Profile View. Within Profile View’s context, you can graphically change pipe locations, change pipe and structure sizes, and swap structure types.

You can use a panorama with Pipe and Structure vistas to edit an entire pipe network. Each vista presents the structure and pipe numbers. These vistas can be used to change almost any pipe or structure value. The biggest issue with these vistas is their size and complexity. Because the vistas contain numerous cells, they cannot be entirely displayed on the screen (you must scroll to see all their data). Also, the column placement can be difficult. It is necessary to move columns around to be able to view related values. In addition, changes made in the vista do not immediately affect the network; rather, they occur once you have exited it. Any changes made in a vista are permanent; there is no cancel or undo.
The pipe network and its objects have extensive settings and styles to automate many design tasks. These settings and styles affect drafting pipes and structures in plan, profile, and section; labeling; structures; and data values. Because there is a difference between sanitary and storm pipe networks pipes and structures, there are two parts lists. Each list specifies its respective typical structures and pipes.

Civil 3D includes an extensive pipe and structure parts catalogs. A catalog defines standard pipe and structure parts. A parts list is a subset of the catalog parts. A parts list contains typical structures and pipes, their descriptions, measurements, rules, and other settings.

Unit 1
Unit 1 focuses on pipe network settings and styles. As mentioned earlier, the settings and styles list is extensive. This unit also reviews the assignment of pay items to items in a parts list.

Unit 2
Unit 2 discusses drafting pipe networks.

Unit 3
Unit 3 focuses on reviewing and editing pipe network data. Both review and edits can be done in Plan or Profile View, either graphically or from a panorama.

Unit 4
Unit 4 covers pipe network annotation when the labeling is not a part of the originally drafted network. This unit also reviews pipes in cross-sections. The unit also reviews creating pipe network pay item reports.

UNIT 1: PIPE SETTINGS AND STYLES

Settings' Pipe Network is an extensive list of settings and styles (see Figure 11.5). Pipe and Structure branches contain settings and values to define their shapes, rules, and labeling styles. Pipe Network defines parts lists for typical systems—storm and sanitary—from the Pipe and Structure branch definitions. A user can define other parts lists such as gas or water.
Parts lists for any one system should include typical structures and pipe sizes. A network branch may have structures and pipe sizes that are different from those of a trunk. In a storm sewer system, branches may be catch basins rather than manhole structures.

When developing parts lists, styles, and settings, it is important that you copy them into a template file. This way, every new job starts with the same settings and you are able to produce consistent drawings.

**EDIT DRAWING SETTINGS**

Settings’ Edit Drawing Settings contains base layer names for pipe, structure, and network objects (see Figure 11.6). The layer list includes entries for pipe networks in Plan, Profile, and Section Views. The problem with the object layer list for pipes and structures is that it defaults to C-STRM. When you want to create a sanitary network, you have to reset the layers. This has to be done each time you define a new pipe network. It is better to define a generic layer name, C-Pipnet, C-Pipnet-Prof, and so on and append the layer name with the network’s name. This allows you use the layer list for any pipe network type. The best way to create these layers is not to create new layers, but to rename the layers in Layer Properties manager. When entering the Edit Drawing Settings, Object Layer panel, the layers will change to the rename layer names.

The differentiation of structures and pipes happens in the structure and pipe styles. In the styles, you would have to use color overrides to produce the correct color for the network items.
PIPE AND STRUCTURE CATALOGS

The pipe and structure catalogs supply basic specifications for pipe network parts lists. A catalog populates many values in the myriad dialog boxes that open while you are developing storm and sanitary parts lists. Unfortunately, there isn’t a menu call to display the catalogs.

Each catalog is in the operating system’s All Users branch (XP) and in Windows 7’s ProgramData folder. The Catalog is a combination HTML file that reads XML data files from folders below the catalog’s location (see Figure 11.7). A catalog contains each type of pipe’s and structure’s sizes and other parameters. The only way to add types and parameters is to edit the XML files in an editor or use Part Builder.
PIPE NETWORK PARTS LIST

When you are developing or adding to a parts list, catalog values appear as content for the Network Parts List dialog box (see Figure 11.8). The Add Part Family command calls the Part Catalog dialog box, which then opens to display its different part categories.

A parts list can include every possible type and size. But like plotting scales, there will be a consistent set of typical pipe sizes and structures for every project. Users can swap a structure part to any size, even those not on the parts list. So, it is relatively easy to handle any exception occurring in any network.

Developing a parts list assigns the structure and pipe styles, rules, pay items, and rendering material. Initially, styles need to be defined prior to their parts list assignment. Rules affect error reporting, structures’ positioning, and other crucial network values. When you change a parts list’s pipes or structures, the change affects only those networks that are created after the change. If you need to change a style, make the change after you have completed the parts list modification.
In the Part Catalog dialog box, to add the selected part family to the part list as a new family of potential part sizes (see Figure 11.9), you toggle ON a part family and click OK. When you select the new family name, after you press the right mouse button and select Add Part Size, a Part Size Creator dialog box opens with pipe or structure parameters (see Figure 11.10). Some pipe or structure parameters are from the catalog and are marked as lists in the source column. When you click in a List Source item value cell and then click its drop-list arrow, a list of selectable catalog values is displayed. Other values are calculated or are from a table that contains a range of values, and those values are identified in the Source column.

The Part Size Creator dialog box entries specify part material, frame, grate, and cover part numbers (see Figure 11.10).
When you add parts to a parts list, Civil 3D assigns pipe and structure styles, rules, pay item, and render materials. Figure 11.8 shows a Storm parts list with assigned structure styles. These styles define how the structures appear in plan, profile, and section (see Figure 11.11). The default styles are set in the Pipe Network’s Edit Feature Settings.

To assign a style, in the Style column, click the icon to the right of the Structure Category. A Structure Style dialog box opens and has a drop-list that contains all structure styles. After you select a style and exit, the selected style applies to all structures in that category. Or, to individually assign a style, you can click in the part sizes Style cell and select a style. Assigning Rules and Render Materials uses the same process.
By selecting a Rule or a Render Material at the category level, you set the value for all of the instances in the category. When you set a Rule or Render Material for a single member, the value is set only for that instance.

**FIGURE 11.11**

**Pay Items**
Chapter 7, Unit 1, discusses defining and the structure of pay items. You assign pay item values to pipes and structures in a parts list. After creating the pipe networks, you can use reports (detailed or summary) from Quantity Take Manager to estimate costs.

**EDIT FEATURE SETTINGS**
These settings affect the values found in the pipe network styles and commands, pipes, and structures.

**Pipe Network**
Pipe network Edit Feature Settings sets default styles for the network parts list and the pipes and structures in the list. The Default Styles section sets default styles for structure and pipe types; their plan, profile, and section labels; render material; and parts list (see Figure 11.12). When you add a part to a parts list, these settings populate the parts values. If the settings are not correct, you will have to change them in the parts list.

The Default Name Format section defines the naming convention for a pipe network, structure, interferences, alignments from a pipe network, and pipe (see Figure 11.12).
Default Rules sets the default pipe and structure rule. Default Profile and Default Section Label Placement set the label locations for pipes and structures. Each entry is an annotation anchor point. An anchor point can be above, below, in the middle, or on the pipe or structure. Each anchor point location affects where a label appears (see Figure 11.13). If you want labeling for storm systems to be different from sanitary systems, you need to adjust these values before you create the labeling.
Pipe styles define a pipe segment’s “look” in a pipe network.

**Plan**

The Plan panel defines how a pipe is displayed in Plan View (see Figure 11.14). The panel’s upper left defines the drafting of the pipe’s walls. If you are not using the pipe’s specs, the pipe size can have a user-defined size: sized by drawing scale, as a percentage of the screen size, or a fixed size.

The panel’s upper right defines how to draft pipe ends. The panel’s lower right defines options for drafting the pipe’s centerline.

The bottom left of the panel defines the pipe’s hatching method and its alignment. Under the hatch alignment toggle is another important toggle: Clean up pipe to pipe connections. When you are drafting pipe-only segments, this selection places a radius at each pipe vertex.
Profile

This panel's settings are the same as those in the Plan panel, but apply to a pipe in Profile View (see Figure 11.15). The lower right contains crossing pipe hatching options.
Section

Section settings define how to hatch a pipe in a cross-section view (see Figure 11.16).

![Image of Section settings](image)

**FIGURE 11.16**

Display

As with any style, you can set a value for each setting, but it is the display panel values that control what is visible in the drawing (see Figure 11.17). When you are using a Civil 3D content template, there are two pipe styles: single line and double line. It is the styles’ visibility settings that differentiate them. The single line style draws pipes by displaying their centerline. The double line style draws two lines that represent the pipe’s interior diameter.
PIPE RULES

Pipe rules define minimum/maximum slope, cover, and segment length rules for pipes (see Figure 11.18). Each pipe size or pipe family can have its own rule set. The Pipe to Pipe Match section allows the user to match pipe inverts by Crown, Centerline, or Invert.

The first pick of any run with pipes uses the minimum cover value to establish the pipe’s invert. All subsequent selections use minimum slope for invert calculations. When you are connecting a pipe to a pre-existing structure, use the Apply Rule command to resize the structure to accept the new pipe’s invert.
When you are using a Civil 3D content template, you can choose from several pipe label styles (see Figure 11.19). A pipe label style is the same as any other label style; it is anchored at a point on a pipe, can label multiple properties, and has a dragged state that can be different from or the same as the original label. The Text Component Editor defines the text contents and its formatting.

FIGURE 11.18

PIPE LABELS
When you are using a Civil 3D content template, you can choose from several pipe label styles (see Figure 11.19). A pipe label style is the same as any other label style; it is anchored at a point on a pipe, can label multiple properties, and has a dragged state that can be different from or the same as the original label. The Text Component Editor defines the text contents and its formatting.

FIGURE 11.19
STRUCTURE
Structure styles define junctions for pipe networks.

Structure Style
These styles define a structure’s form for plan, profile, section, and model.

Model
Model defines a structure as a shape from the catalog (see Figure 11.20). If you are not using the catalog shape, other simpler shapes are available: box, cylinder, sphere, and a part-defined shape.

Plan
Plan sets the symbol that identifies a structure in Plan View (see Figure 11.11). Size options control the symbol’s size: by drawing scale, a fixed scale, in absolute units, size as a screen percentage, or as defined by the catalog parameters.

The Enable Part Masking toggle allows the structure to mask out connecting pipes.

Profile and Section
Profile and Section defines how a structure is displayed in a Profile or Section view (see Figure 11.21). By default, the structure appears as a boundary in a Profile View. Or, the structure can be displayed as a block or solid. If you select block, sizing options become available.
Display panel controls what components are displayed and their layers when you are using a style (see Figure 11.22).
Structure Rules
Structure rules affect the invert drop amount across a structure, sump depths, and maximum pipe diameter (see Figure 11.23).

![Structure Rule Set - Basic](image)

FIGURE 11.23

Structure Labels
These label styles annotate structure information (see Figure 11.24). Labels include station/offset, name, rim, and so on. Structure labels have a special label component for each pipe (in and out). This component type labels each connecting in and out pipe’s invert.
INTERFERENCE STYLES

Pipe networks can check for interferences (colliding pipes). Interference styles define the markers at the interference (see Figure 11.25).
SUMMARY

- Edit Drawing Settings sets the default layers, modifiers, and their values for pipes, structures, and pipe networks.
- Pipe Network’s Edit Feature Settings values set initial styles, naming format, and labeling values for pipes and structures.
- If you want to label using different label anchor points, they must be changed in Pipe Network’s Edit Feature Settings.
- A pipes and structures catalog provides the basic shapes and specs.
- Parts lists use values from a catalog, but those values are generally a subset of all possible sizes and types.
- A pipe rule affects slope, cover, and length.
- A structure rule affects invert drop, sump, and maximum connecting pipe sizes.
- Label pipe networks while you are drafting them or after you have drafted them.

UNIT 2: CREATING A PIPE NETWORK

After defining styles, parts lists, and rules, you next create the pipe networks. You create pipe networks using two methods. Create Pipe Network From Objects creates a network from a selected drawing or Xref object. If you are selecting a line or arc, each selected line and arc becomes its own pipe network. If selecting a polyline, the entire polyline becomes the pipe network. Pipe Network Creation Tools displays a toolbar that has drafting and editing tools (see Figure 11.2).

The Network Layout Tools toolbar lists the current parts list (storm, sewer, etc.), surface, and alignment (if referenced). Its middle portion lists the current structure type and pipe size. To the right of the pipe size is the drafting mode icon stack: Structure and Pipes, Pipes Only, and Structures Only. Structures Only locates structures with no connecting pipes and Pipes Only drafts pipes with no structures. Before you begin drafting, you must set the current slope. If it is set to up, then you are drafting from the lowest invert to the highest, and down from highest to lowest. All pipes and structures drafted with the toolbar active are members of the current network. If you have exited the toolbar, to continue working on the just-drawn network, you must edit it (Edit Network).

Pipes and structures receive names from the pipe network’s Edit Feature Settings name template. It’s easier to let Civil 3D name the pipes and structures and then edit their names in their Properties or vista. If the network is large, it may be confusing to edit in the Edit Network vista, because it shows all pipe or structure values. Without carefully tracking the network values, it is easy to make mistakes in the vistas.

PIPE DRAFTING ICONS

When drafting a pipe network, you may want to connect a lateral pipe to an existing structure. When doing this, Pipes displays a starburst icon to the cursor’s upper right. The starburst icon indicates, if you select the point, the pipe will attach to the structure.

When you want to break a pipe to attach to it, Pipes displays an “opposing fists” icon to the cursor’s upper right. This icon indicates that selecting the point will break the pipe and either attach a pipe, the pipe (a pipe–pipe intersection), or place a structure at the selected point connecting the points.
PIPE NETWORK FROM OBJECT

This routine creates a pipe network from the current drawing’s or xref’s entities. The routine first prompts to select an entity. After selecting the entity, the routine prompts to accept or change the network’s direction. After setting the network direction, the Create Pipe Network from Object dialog box displays. See Figure 11.26. The dialog box’s top sets the Network’s name, the default parts list, structure, and pipe size.

The dialog box’s middle portion sets the network layers, surface, and alignment.

The dialog box’s lower portion toggles the eraser of the selected entity, and if the selected entity has elevations, what do those elevations represent on the network. A vertex can represent the pipe’s Outside Top, Crown, Centerline, Invert, or Outside Bottom.

FIGURE 11.26
The converted entities can be in the current drawing or in an Xref. The entity types used by this routine are:

**Line**
Creates a pipe network from the straight line and places a structure at each end.

**2D Polyline**
Creates a pipe network with structures at each vertex and pipes along the polyline segment. If the polyline contains a curve segment, the resulting pipe is also curved.

**2D Spline**
Creates a pipe network with structures at each vertex and removes the curves replacing them with straight line pipes segments.

**3D Polyline**
Creates a pipe network with structures at each vertex and pipes along the polyline segment. A 3D polyline cannot have a curve segment.

**Arc**
Creates a pipe network with a curved pipe segment and structures at each end.

**Feature Line**
Creates a pipe network with structures at each vertex and if the feature line contains curves creates curve pipe segments. Each vertices’ elevation is a elevation in the pipe network.

**Alignment**
Creates a pipe network with structures at each vertex and pipes along each tangent. If the alignment contains a curve segment, the resulting pipe is also curved.

### SUMMARY
- A pipe network uses a parts list to set typical network structure and pipe sizes.
- If you have prematurely closed the pipe Network Layout Tools toolbar and you want to continue working with the pipe network, use Edit Network to continue working on the network.
- You can connect between different pipe networks.
- The current drafting mode remains active even when you change structure and/or pipe size or Upslope/Downslope.
UNIT 3: PIPE NETWORKS REVIEW AND EDIT

Besides adding to an existing pipe network, other situations require network pipe or structure edits (e.g., changing rules, resizing a pipe or structure, swapping structures or pipes, changing styles). Graphical editing includes moving, disconnecting and re-connecting elements, and deleting structures and pipes. Interference checks indicate areas that need to be edited.

When you select a pipe or a structure and press the right mouse button, a context-sensitive shortcut menu is displayed (see Figure 11.4). In Figure 11.4, the shortcut menu on the left is displayed when you select a pipe segment. Also in Figure 11.4, the right shortcut menu is displayed when you select a structure. Both menus include Edit Network …, which displays the pipe Network Layout Tools toolbar.

Reports Manager or Toolbox contain several pipe network reports: Pipes and Structures in HTML and CSV formats.

NETWORK PROPERTIES

Pipe Network Properties include the original layout settings (see Figure 11.27), what labeling styles annotate the pipe network in a profile (see Figure 11.28), the layers the network uses in section views, and a review of the network statistics.

FIGURE 11.27
PIPE PROPERTIES

When you select a pipe segment and, from a shortcut menu, you select Pipe Properties ..., a Pipe Properties dialog box opens and has pertinent pipe segment values. The Information tab renames and reassigns the object style or the render material. The Part Properties panel displays inverts and part data and sets the resize rule (see Figure 11.29). Any value in black is editable. The Rules panel displays the currently assigned rules and informs you if the pipe violates any rules (see Figure 11.30). If a rule is not met, an icon is displayed next to the broken rule.

Pipe Properties edits apply only to the selected pipe. Swap Part changes only the pipe’s size. These edits do not allow changing pipe types and should be done as a network edit.
STRUCTURE PROPERTIES

Structure Properties shows a structure's values. The Information tab renames or reassigns the object style or the render material. Part Properties displays information about the part and any calculated values (see Figure 11.31). Any value in black is editable.

FIGURE 11.29

FIGURE 11.30
Connected Pipes displays pipes connected to the structure, their rules violations, their inverts, and other critical information (see Figure 11.32).

Rules display the current rules and inform you if the structure violates any of them (see Figure 11.33). If a rule is not met, an icon is displayed next to the broken rule.

Structure Properties edits apply only to the selected structure. Swap Part changes the structure type and/or size.
SWAP PART: PIPE AND STRUCTURE

Swap Part exchanges the currently selected object with another object from a list of applicable choices (see Figure 11.34). Swap Part does not allow any changes to a pipe’s type. Swap Part for a selected structure allows changes to the part type (head-wall to eccentric cylindrical).

FIGURE 11.33

FIGURE 11.34
GRAPHICAL EDITING

When you graphically edit a pipe network, pipes and structures are treated as connected objects. By selecting a structure, activating its grip, and relocating it, the attached pipes are relocated.

If you are grip editing pipes and you also want to move their attached structure (see Figure 11.35), the selection must include the structures. If you do not select the structures, and if the pipes are moved, then they are disconnected from the structure. To reattach pipes to a structure, relocate the structure to the pipe’s vicinity and individually reconnect the pipes. To reattach a pipe, you click the pipe, press the right mouse button, and from the shortcut menu, select Connect to part. The routine prompts you for a connecting structure. In the drawing, select the appropriate structure.

To disconnect a pipe from a structure, activate its grips and move it away from a structure. If you want to disconnect a structure from a pipe, select the structure, press the right mouse button, from the shortcut menu, select Disconnect from part, and select a pipe. If there is more than one pipe, disconnect each pipe and then move the structure, or delete the structure, place a new structure in the desired location, and reconnect the pipes.

CONNECT AND DISCONNECT PART

Connect and Disconnect Part separates a pipe or structure from adjacent pipe network objects. This is useful when you are inserting new structures and pipes in existing networks or when you are graphically editing network components.

PROFILE EDITING

Pipes and structures that appear in a profile view can represent a selection set or an entire pipe network. All pipes and structures display their properties and can be graphically edited.
INTERFERENCE CHECKING
When pipes cross, there is potential for them to intersect or not have enough vertical separation. Interference Check analyzes the separation between pipes of different networks or selected pipe segments (see left side of Figure 11.36). Distance checking is a user-specified value or scale factor. Create Interference Check sets this value in the 3D proximity check Criteria dialog box (see right side of Figure 11.36).

If you are editing pipe networks that are participating in an interference check, the interference goes out-of-date. To recalculate the interferences, click the interference, press the right mouse button, and from the shortcut menu, select Rerun Interference Check.

MERGE PIPE NETWORK
The Merge Pipe Network routine displays a pipe network list and prompts you to choose which network to merge. After selecting the pipe network to merge, a second dialog box displays prompting you to select which pipe network the previously selected network merges into.

SPLIT PIPE NETWORK
The Split Pipe Network routine prompts you to first select pipe network parts and, after selecting the parts, prompts you to select a pipe network you want to add the selected parts to. If you do not want to add the parts to an existing pipe network, you can create a new pipe network from the selected parts.
SUMMARY

- To add branches to an existing network, you must edit it.
- You can attach a pipe from one network to a structure of a second network.
- When you are drafting upslope, the start invert is the lowest.
- When you are drafting downslope, the start invert is the highest.
- When you are attaching a pipe to a structure, a star icon (connect to structure) is displayed.
- When you are attaching a pipe to a pipe, a break at connection icon (two opposing fists) is displayed.
- If you are moving structure with pipes, you need only to select the structure. The pipes will relocate to the new structure location.
- To disconnect a pipe from a structure, select just the pipe and then relocate it.
- Editing pipe or structure parameters is best done in their Properties dialog box.

UNIT 4: PIPE LABELS

Labeling a pipe network occurs during or after its creation. The Create Pipe Network dialog box is used to set structure and pipe label styles while drafting the network (see Figure 11.3). The Add Labels dialog box is used to add labels after you have created the network (see Figure 11.37).

There are two network label style types: pipes and structures (see Figure 11.5). Add Labels annotates individual parts or entire networks in plan, profile, or section. When you are labeling single parts, only the selected part is labeled. To label another part, select the next part.

By default, pipe labels do not use plan readability, but structure labels do.
STRUCTURE LABEL STYLES
A structure label annotates specified structure parameters. A structure label can include the structure name, its rim and sump elevation, in and out pipe invert, clearances, and other parameters (see Figure 11.38).

PIECE LABEL STYLES
A pipe label annotates specified pipe parameters. A pipe label can include the pipe name, its starting and ending invert elevations, beginning and ending structure name, cover, and other parameters (see Figure 11.39).
PIPPES IN SECTIONS

When you are creating a pipe network, you use the Create Pipe Network dialog box to set an association to an alignment (see Figure 11.3). If a network exists before you create a sample line group, its pipe and structure data is available for sampling (see Figure 11.40). If you do not want to sample a network, toggle it off before you create the sample line group. If you are developing a network after you have created a sample line group, the group needs to be resampled with the network(s) added to the sample list.
CROSSING PIPES – PROFILE VIEW
Pipes and structures that intersect a profile view represent possible interferences and are a necessary part of any document. The Pipe Networks tab not only displays the drawn pipes and structures, but also displays all defined networks. Drawing the intersecting pipes and structures is a two-step process. First, you toggle on the pipe or structure to draw, and second, you choose what style will be used for your drawing (see Figure 11.41).

FIGURE 11.41

PIPE NETWORK REPORTS
Civil 3D’s Toolbox has several reports for pipe network quantities (see Figure 11.42). The Toolbox reports focus on quantities, not costs. The pay item reports focus on pipe and structure costs.
Pay Item Reports
Objects with pay item assignments are available for reports using the item’s values. There are two types of pay item reports: summary and detailed. A summary report lists the pay item ID, its description, total quantity, and unit of measure for each pay item. A detailed report contains a line of information for each selected object.

- A pay item report’s scope is a drawing, sheet, or selected objects.
- A summary report does not calculate values for corridor codes.
- A detailed (itemized) report calculates Corridor codes assignments.
- If the pay item relates to an alignment, the report can be limited by alignment station values.

You assign pipe network pay items in the parts lists (see Figure 11.8).

For a discussion on Pay Items see Chapter 7, Unit 1.

SUMMARY
- Pipe network label types are pipe and structure.
- Civil 3D template label styles are simple and do not represent all pipe or structure properties.
- A pipe network should exist before you create the sample lines.
- A profile view can contain crossing pipe segments.

This ends the chapter on pipes. Chapter 12 reviews Civil 3D data-sharing methods.