Introducing
AutoCAD®
Civil 3D® 2009

JAMES WEDDING, P.E.
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Introducing AutoCAD Civil 3D® 2009

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Neil Edde
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About the Authors

This book was written as a team effort from day one, but here’s a bit more about the two names on the cover.

James Wedding, P.E., spent nearly a decade in the Dallas/Fort Worth land development industry before partnering with Engineered Efficiency (EE) in February 2006. A graduate of Texas Tech with a BSCE in 1997, he worked as a design engineer focused on private development. His design experience includes small commercial to multiphase single-family and master planned communities. James has served as president of the Preston Trail Chapter of the Texas Society of Professional Engineers and was selected their Young Engineer of the Year in 2003.

One of the earliest gunslingers for the Civil 3D product, James has worked extensively with the Autodesk product team to shape and guide the software’s development. James is a highly rated repeat presenter at Autodesk University and a presenter on the Friday Civil 3D webcasts.

Dana Probert, E.I.T., received her BSCE from Georgia Tech in 1998. Since then she has worked for consulting engineers in the United States and Canada, doing a variety of civil projects such as large planned residential communities, small subdivisions, commercial site design, stormwater management, road design, sanitary sewer networks, stream restoration projects, and municipal GIS. For most of this work, she has used AutoCAD-based products, including Land Desktop, Civil Design, Raster Design, Autodesk Map, and Civil 3D. Dana began instructing Civil 3D users in October 2004, and since then has used Civil 3D herself for subdivision-layout design, road design, grading, stormwater management, and utility projects.

In addition to her own design work, Dana has been working closely as a team member with several firms on their Civil 3D pilot projects and implementation plans, and taught many Civil 3D training classes. Oh, and she also built the best 52-baseline corridor known to man.
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Introduction

If you haven’t hidden your head in the sand the last few years, you know the world of land development is all about going 3D. It’s the next jump from the board to CAD to the model. The magic question of course is, “How do I get there?” If you’re part of the Autodesk world—as so many engineers, land planners, and surveyors are—then the answer to that question is AutoCAD Civil 3D.

With the growing maturity of the Civil 3D product, more and more users are making the jump from AutoCAD Land Desktop or other civil engineering software suites, and that means the user base is growing. Part of that growth is the new or occasional user who just wants to understand what all the hubbub is about, and how to make some use of all this modeling information. Civil 3D is a complicated product, and after five years, most users will still say they learn something every day, in spite of being the experts in their office. This book isn’t for them. This book is for the project manager who needs to understand what his engineers and designers are doing. This is for the engineer who has moved more into a team-management role, but still contributes to the design process. This is for the new student who wants to get a feel for all the pieces that make up a Civil 3D model, and why all these tools are used instead of just lines, arc, and polylines. If you’re looking to get a basic understanding of what Civil 3D is all about, and to get a quick peek at the full toolset from points to project data management, then this is the book for you.

How to Use This Book

This book covers the basics of creating, editing, and using the elements that make up the Civil 3D universe. You won’t find every setting covered in detail or presented with the most complex uses. You’ll find straightforward examples and language that give you a clear path to understanding and a level of confidence to begin taking on bigger tasks within your Civil 3D designs.

The book is essentially a catalog of tools, arranged according to features and object sets. Each chapter describes an object and a bit about why it’s different from your stock AutoCAD objects. You’ll get some discussion, and then go right into step-by-step exercises that walk you through the creation of most objects types in a couple of different ways. You’ll look at some of the most common creation options, with further exercises
that let you explore these as well. After you have created some Civil 3D objects, you’ll move to editing and styling objects to suit your needs. Each chapter wraps with a quick summary to help you remember all that was covered and the purpose a given feature serves.

This book assumes a basic understanding of the core AutoCAD package and Microsoft Windows. Although you won’t get into complex AutoCAD commands or sequences, this book assumes that you can draw lines and arcs, copy objects, and use osnaps within the program.

Running Civil 3D is not a job for your old computer. Although the models and exercises presented here are very basic, hardware deficiencies are some of the most common sources of frustration with Civil 3D. It’s simply a very demanding application even in basic design models. In case you’re curious, here’s a list of the recommended specifications according to Autodesk:

- Microsoft Window Vista Ultimate/Business/Enterprise or XP (SP2)
- Intel Pentium 4 (3GHz or higher) or AMD Athlon
- 3GB RAM
- 5GB free disk space for installation
- 1,280 × 1,024 display with true color, 1,600 × 1,200 or greater recommended (OpenGL® accelerator with full OGL ICD support not required)
- Microsoft® Internet Explorer® 6.0 (SP1 or later)
- DVD drive

You can (and should) visit the Autodesk website (www.autodesk.com) and review system requirements for any changes since this publication.

**What’s Inside**

Before you even flip through the rest of this introduction, point your web browser to [www.sybex.com/go/introducingcivil3d2009](http://www.sybex.com/go/introducingcivil3d2009) and begin downloading the data and drawings that go along with the exercises. This way, once you’re done with this introduction, you’ll be ready to roll right into the text.

This book moves through the Civil 3D program in a way that seems to match the way most people use and learn it. It starts with the general setup, and then moves on to points, surfaces, and corridors, and ends with team data management. Each chapter covers a general feature, and although some chapters build on skills or concepts covered in previous chapters, most stand alone as well. If you’re set on hitting a specific topic right off the bat, we’d still suggest that you start with Chapter 1 just to get familiar with the Civil 3D environment—you’re not in AutoCAD anymore, Toto.
The first two chapters cover the changes to the Civil 3D environment:

**Chapter 1: Welcome to the Civil 3D Environment** discusses the Prospector and Panorama, along with the other interfaces you’ll use to understand and build your Civil 3D model. You’ll also explore Civil 3D styles, and how they make the display of your models easier than ever to manage.

**Chapter 2: General Tools** covers tools you’ll use throughout your Civil 3D experience, including the Civil 3D–specific Inquiry and Tool Palettes. You’ll also explore some standard AutoCAD tools that are part of the Civil 3D package, but you might not have used them before.

Unlike the core AutoCAD product, AutoCAD Civil 3D has not adopted the ribbon interface.

The next few chapters look at getting the initial data into the model:

**Chapter 3: Lines and Curves** teaches you how to use existing legal descriptions or linework to begin creating your Civil 3D drawing data and how some Civil 3D tools can be applied to regular AutoCAD linework.

**Chapter 4: Survey** takes the model from the outside world into your computer. Working with field books and figures, you’ll see how to translate basic on-the-ground survey data into the basis for a Civil 3D model.

**Chapter 5: Points**, gives you hands-on practice importing points from outside data, creating points for your own modeling use, and labeling them as needed.

With a basic idea of the site in place, you’ll want to look at setting out your site and reviewing it. The next two chapters tell you how:

**Chapter 6: Parcels** covers the creation of parcels and getting your basic labeling together to create plans you can submit for review.

**Chapter 7: Surfaces** begins to get to the heart of the 3D environment. You’ll explore how to build a basic surface from Google Earth information and from points. You’ll also explore how contouring and labeling can help you understand this surface better.

The next two chapters work hand-in-hand to help you begin your design work:

**Chapter 8: Alignments** gives you hands-on practice creating alignments from existing linework and from scratch, as well as labeling and stylizing them to meet your requirements.

**Chapter 9: Profiles and Profile Views** shows you how to cut profiles, and then lay in a design profile to describe your proposed model. You’ll also learn how to manipulate the profile views, setting different scales and attaching labels to make the data more understandable.

With the basic elements of Civil 3D in place, you’ll begin looking at all the parts that make up the finished model.
Chapter 10: Assemblies and Corridors is all about Road Design in Civil 3D. You'll build a typical cross-section called an assembly, and use the alignment and profile data to create a 3D model of that road. You'll also look at creating a surface from the corridor, the first step in preparing a final ground model.

Chapter 11: Sections walks you through the process of cutting sections, displaying them in your drawing, and making arrays of sections to make plotting easier.

Chapter 12: Grading covers feature lines and grading groups, the two primary tools for building the part of your model that isn't defined in a corridor. You'll create feature lines from objects and alignments and use a single feature line to set the grades for others. You'll also make a grading group based on a feature line, building a drainage channel as a function of a single feature line and some parameters. Finally, you'll put both the feature lines and grading group into a composite finished ground model and run a quick earthworks analysis.

Chapter 13: Pipes walks you through picking the parts for your pipe network, the layout of your network, and getting it displayed just right. You'll also push those pipes and manholes into a profile view and explore the relationship between plan and profile as you edit.

Chapter 14: Projects looks a bit outside the technical engineering aspect of Civil 3D and at how to pull the team together using the data shortcuts feature. You'll see how to make a typical project folder structure, how to make a new project within Civil 3D, and how to share your design data with other members of your team.

How to Contact the Authors
The idea for this book came from the growing number of users who have said, “I wish I had some way to explain the basics of Civil 3D to my boss and the new guys.” We've attempted to incorporate the things that make us excited about Civil 3D, and what we would show to someone who asked us to explain why we’re so excited to be involved with this product. With that in mind, there are always things that could be covered in more detail, or perhaps features that we should include here. If you have ideas on how to improve this text, please contact us both at introducing@eng-eff.com. Although we can't reply to every message, we do read every one and we value your feedback.

Sybex strives to keep you supplied with the latest tools and information you need for your work. Please check their website at www.sybex.com, where we’ll post additional content and updates that supplement this book if the need arises. Enter Civil 3D in the Search box (or type the book’s ISBN—9780470373163) and click Go to get to the book’s update page. You can also find updates and more information at www.civil3d.com/errata.

Thank you for picking up Introducing AutoCAD Civil 3D 2009. We appreciate it.

—James Wedding, P.E. and Dana Probert, E.I.T.
Welcome to the Civil 3D Environment

To paraphrase, Civil 3D isn’t your father’s AutoCAD. If you’re just getting into the Civil 3D environment, want to learn how to get around in models, and would like to understand the object styles and labels, then this is the place to start. Even if you’ve had a class or two, this chapter will provide a good review of some definitions, terms, and techniques used throughout the book.

This chapter starts by examining the general interface of Civil 3D, the various palettes that are part of Civil 3D tasks, and some parts of the interface that are new to 2009 in general. You’ll learn how to create a new Civil 3D-based drawing in order to understand the way Civil 3D uses styles to display the various objects that are part of your projects. You’ll explore the differences between plan, isometric, and profile styles for various objects, and how these styles and layers work together. The chapter then discusses some general labeling topics, including the relationship between Civil 3D text and drawing scale, how styles determine label accuracy and placement, and how you can share styles of all sorts with the rest of your office. As a last bit, you’ll look at the help system, and we’ll point you to some great online resources for further exploration.

This chapter includes the following topics:

- The Toolspace palettes
- Object display styles
- Object label styles
- Navigating in 3D
- Creating new Civil 3D drawings
- Sharing styles and template creation
The Civil 3D Interface

As soon as you load Civil 3D for the first time, you’ll see some changes afoot. Unlike most versions of AutoCAD, Civil 3D asks you to pick a workspace right off the bat, before you even really know what you’re selecting. This section explores the menus and palettes that are unique to Civil 3D.

Civil 3D is built on AutoCAD, and there are many good texts on learning AutoCAD. Mastering AutoCAD 2009 by George Omura (Sybex, 2008) is a popular choice. Because this text is focused on learning Civil 3D, issues or customization options that are based on the AutoCAD technologies will generally be mentioned more in passing than in detail.

When you first launch Civil 3D, you’re presented with a question about workspaces. The default is Civil 3D Complete, so most users select that. It’s also where you’ll be working for most of this book.

WHAT’S A WORKSPACE?

Workspaces are Autodesk’s answer to having the right tool at the right time for the right job. Workspaces allow you to pick and choose the toolbars, menus, and palettes that make up your screen. By picking different combinations based on the tasks at hand, you can minimize the number of toolbars on your screen, limit the number of options presented to new users, and spend less time in menus and more time working. Civil 3D comes with five workspaces right out of the box: Design, Annotation and Drafting, Survey and Topographical, Visualization and Rendering, and Civil 3D Complete.

When Civil 3D has finished loading (and assuming you’ve accepted the default Civil 3D Complete workspace), it looks something like Figure 1.1. There are all kinds of new buttons and controls along the bottom of the drawing area—be sure to check out the AutoCAD Help for more information.

Here are a couple of basic definitions:

- **Palette set:** A container for palettes. In Civil 3D, this typically contains the Toolspace, Panorama, and Tool palettes. A palette set can be turned on and off; it can collapse automatically when the mouse moves away, and you can make it semitransparent. Palettes within Palette Sets can be toggled on and off.

- **Palette:** One tab within a palette set. Most AutoCAD users are familiar with the Tool palettes set, and the ability to control which palettes (such as Hatching, Rendering, Blocks, and so on) appear. In Civil 3D, you turn on and off the Survey and Toolbox palettes within the Toolspace palette set by choice, and palettes will come and go from the Panorama palette set as needed to give you feedback.
It’s all much more confusing to read than it is to use, so don’t worry.

Civil 3D includes a number of different palettes for handling blocks, plotting, Xrefs, layers, and so on. These are great tools, but first let’s examine the palette sets that make up the power of Civil 3D: Toolspace and Panorama.

Toolspace in Civil 3D

In Figure 1.1, the only palette set showing by default is the Toolspace. You’ll find that you’re in Toolspace almost constantly as you work with Civil 3D, so most users leave it open and docked to one side or another. If you have a second monitor, dragging it to the second screen is a suggested plan as well. Toolspace is where you will spend most of your time interacting with Civil 3D’s model and the settings that drive it. Additionally, this is where you’ll work with Survey information and generate reports to XML or text formats. Model information, drawing settings, survey, and reporting are each handled by separate palettes: Prospector, Settings, Survey, and Toolbox respectively. This chapter focuses on Prospector and Panorama because they’re part of the overall package. Chapter 4, “Survey,” deals with the Survey palette, and Chapter 2, “General Tools,” covers the Toolbox.
Prospector

Prospector is the main entry to the model you’ll build with Civil 3D. This is where you’ll dig into the various objects, work with Project Data, and create new drawings. Prospector has some major controls that we want to look at before getting deeper into individual model items. Because there is so much going on, let’s start at the top with a couple of buttons that make getting around in Prospector easier.

The first button you’ll want to know about is the preview toggle that turns on and off the object previews on a global level. As drawing objects are created, they generate previews that can be displayed in Prospector in a preview pane. This button toggles that pane on and off. For example, Figure 1.2 shows the different results when you select a parcel with the preview toggle on versus when it’s off.

Figure 1.2
Preview toggled off (left) and on (right) when reviewing a parcel. The preview is a 3D view.

As you are looking at objects in a preview window, it’s important to remember two things. First, previews can be toggled on and off for Prospector, as well as for the object branches such as Surfaces, Parcels, and so on. If you don’t see the preview when the master toggle is on, check the object branch by right-clicking on the branch and reviewing the menu for Show Preview. Alignments, Surfaces, Networks, Corridors, Assemblies, and Subassemblies can display previews within Prospector. Second, the preview area is a 3D view, so you can use the ViewCube in the upper right to rotate, spin, or twist your perspective. (You’ll learn more about this cube in the next chapter, which discusses basic AutoCAD tools that help in Civil 3D modeling.)
The second button you’ll want to familiarize yourself with is the Item View Orientation toggle. When using Toolspace as a floating-palette set, this toggles where the Civil 3D list view of various object is oriented, at the right, or at the bottom of the palette. Figures 1.3 and 1.4 show the two options. This toggle can make large amounts of data much more accessible when you’re working with list view, so just remember it’s there.

The last piece of the main controls you’ll want to familiarize yourself with is the drop-down menu for view selection. In this menu, you can select between Master View and Active Drawing View. In Master View, all the branches are presented, including multiple drawings if you have more than one open, the Projects branch, the Data Shortcuts branch, and the Drawing Templates branch. In Active Drawing View, you will see only the data relating to your current drawing. This is handy when you’re working with a large number of drawings in general, so you can have them all open but focus on one drawing for the current tasks.

![Figure 1.3](image1.png)  
List view displayed at the bottom of Prospector

![Figure 1.4](image2.png)  
List view displayed at the side of Prospector

**TEACHING PAINTING OVER THE PHONE**

The exercises in this chapter might be more difficult than they should be, simply because you aren’t seeing the same things we are. Just to give you a fighting chance, the setup used for the exercises and image captures is the default Civil 3D 2009 Civil 3D Complete workspace, displayed in a 1280x1024 window. Toolspace and Panorama will be floating, and not docked as we use them. We have used the resize handles on some windows to make things easier to read.
Chapter 1: Welcome to the Civil 3D Environment

Beyond the controls, Prospector has one main pane that never goes away, and an additional pane that shows the list and preview areas when needed. This main pane resembles Windows Explorer’s Folder view, with plus symbols designating areas that have deeper objects. These symbols also allow for expansion and contraction as needed to manage the display of various data objects. Let’s take some time to review the buttons discussed earlier, and explore the relationships between various objects.

1. Open the Exploring Prospector drawing file. (Remember, all the data for this book can be downloaded from www.sybex.com/go/introducingcivil3d2009.) This drawing shows a typical subdivision layout, with parcels and alignments defined.

2. Within Toolspace, make sure the Prospector palette is selected by clicking its tab.

3. Change the view selection to Active Drawing View to turn off the extraneous information for now. Your Toolspace should look something like Figure 1.5.

4. Expand the Alignments branch, and then select Carson Circle by left-clicking. Note that no preview appears as you might expect.

5. Right-click on the Alignments branch and select Show Preview as in Figure 1.6.

6. Pick Carson Circle again and notice that the preview is now displayed at the bottom of the preview pane.

7. Select the Alignments branch, and note that the full collection of Alignments is now displayed at the bottom of the list area. If your Toolspace is too narrow, you can use the scroll bar to move across all of the columns.

---

Figure 1.5
Prospector showing the collapsed tree view of the Exploring Prospector drawing file. Note that some branches have plus signs indicating that they contain more subbranches.

Figure 1.6
Turning on Previews for Alignments
8. Click the plus sign next to Sites to expand that branch, and then expand the Site 1 branch as well.

9. Click the Parcels branch to have the parcels in the drawing listed at the bottom of the list area. This list is fairly long, so the short, wider window isn’t as efficient at showing the data.

10. Click the Side/Bottom toggle as indicated in Figure 1.5 and note that the list area jumps from the bottom of your palette to the side as shown in Figure 1.7.

You can also customize the columns and data displayed in the list view to make it more concise. Beyond the preview and list views of objects, Panorama can also be used to make quick edits without moving into the drawing space, navigate the drawing, or make easy changes to multiple items. These changes often come when you’re trying to change the labels on a series of Parcels, or want to change the style of all your alignments at once. Now you’ll work with some of the controls in the preview area to customize the data presented:

1. Continuing with the Exploring Prospector drawing, make sure Parcels are still selected, populating the list view.

2. In the List area, scroll to the right until the Perimeter column is visible.

3. Click and drag the header to rearrange the Perimeter column to the left of the Area column. Any time a list is presented in this view, you can drag the column headers to rearrange the view.

4. Once you’ve moved Perimeter, scroll a little further to the right to see the Address column.
5. Right-click on the Address column header and select Hide Column as in Figure 1.8 to make it disappear. You can use the Hide Column option to make an individual column disappear, or you can move down the list that appears and uncheck columns as you see fit. These changes are persistent, which makes customization worth the seconds it takes.

6. Select the Alignments branch to display the alignments in the list view.

7. In the list view, double-click the Name field for Timber Fork, and notice that the name becomes editable.

8. Change the name to Claire Point and press Enter. Notice that this immediately updates the main Prospector pane as well.

9. In the list view or tree view, right-click the renamed Claire Point, and select Zoom To. The ability to zoom to almost any object using right-click menus makes project and model navigation very easy.

10. Click the Alignments branch one more time to bring back the list view back.

11. Select the first item in the list to highlight it.

12. Hold down the Shift key and click the last item in the list. This will highlight all the items between the two selected. If you need to remove an item from this selection, hold down the Ctrl key as you pick individual items.

13. With all the alignments highlighted, scroll to the right to find the Style column.

14. Right-click the Style column header as shown in Figure 1.9 and select Edit to bring up the Select Style dialog.

15. Select Layout from the Style drop-down list, and click OK to dismiss the dialog. Note the change in the arc portion of Claire Point.

The Prospector and its various views can be invaluable in working with data efficiently. When you’re trying to find a short alignment or zoom to the correct profile view, the navigation aids in Prospector can shave a few seconds off every search. The ability to mass-change styles and properties is available only in Prospector.
The two branches related to Project and Data Shortcuts that appear in the Prospector pane when Master View is selected are discussed in Chapter 14, “Projects.” The Drawing Templates branch is merely a list of the files that are included in the default drawing template folder in your installation, and it can be generally ignored. For most people, the power of Prospector is in the Drawings area, which we’ve already covered, so let’s look at the Settings tab.

**Settings**

Although most of your time making Civil 3D really come alive will be spent using the settings and styles, we won’t go into great detail in this text. The purpose here is to give you a basic understanding of all the things that are going on, letting you know the major controls, and keeping you moving forward. At a basic level, there are three items in this palette you should understand:

- **Drawing settings** control the coordinate system default layer and naming conventions and abbreviations.
- **Object styles** control the display of the Civil 3D model objects (such as alignments, profiles, surfaces, and so on) in Plan, Model, and Profile views.
- **Label styles** control the rotation, layering, text, accuracy, and display of all object labels and tables.

The following sections discuss drawing settings and styles and include some exercises to illustrate how the changes made in this palette ripple through the drawing itself.

**DRAWING SETTINGS**

When you first create a new blank drawing in AutoCAD or Civil 3D, you’ll find yourself hovering around a coordinate of 0.0. This works fine on objects and designs that have no dependence or tied relationship to the real world, such as a house, or a bolt, or a new car design, where the coordinates of the drawing simply don’t matter very much. With land development, however, most projects are going to be built in the real world, with real sites and coordinates, and location is precisely determined on both the front and back ends of the project.
To solve this problem, Autodesk has built coordinate systems into the Civil 3D system, you simply have to tell the program which coordinate system you’d like to use. Let’s take a quick look at this setting, and some of the other items in the Drawing Settings dialog.

1. Open the Exploring Settings drawing file.

2. Change to the Setting tab in Toolspace. Note that the same view drop-down menu exists as in Prospector with some different options: Active Drawings Settings View, Active Drawings Labels Only View, and Labels Only View. For the purpose of this exercise, you’ll stay in Master View.

3. Right-click the Exploring Settings file name and select Edit Drawing Settings, as shown in Figure 1.10, to bring up the Drawing Settings dialog.

The Units and Zone tab provides options for Units, Conversion Factors, Scale, and Zone. For the most part, you’ll use the Zone portion of this dialog to get your drawing into a real coordinate system.

4. On the Categories drop-down list, select Honduras.

5. On the Available Coordinate Systems drop-down list, select Honduras, Norte; Meter. If you know the Coordinate System Code for the area you’re working in, you can enter it where indicated in Figure 1.11.
You’re now prepared to do survey work in La Ceiba, Honduras, should you ever get a job there. Beyond the coordinates, the most common changes generally relate to abbreviations and terminology, so you’ll fix them next.

6. Click on the Abbreviations tab. The settings here are the values that Civil 3D uses when it abbreviates or calls out an option in a label style.

7. Click in the Value column for the Left row and the ellipsis button will appear just to the right. Click the ellipsis button to open the Text Component Editor.

8. Click just to the right of the L and enter t. Then click OK to close the dialog.

9. Repeat this process for the Right row to change the value to Rt.

10. Click OK to dismiss the dialog.

These simple changes will tell Civil 3D to use Lt. or Rt. anytime it abbreviates a direction, such as in an offset label. There are also options for Point of Curvature, Reverse Spiral Point, and so on, which can be set however you desire. Now that you’ve modified a few drawing level settings, let’s explore some object settings and styles. This is where the real power of Civil 3D comes to light.

**OBJECT STYLES**

Working with object styles is where most people begin to see the real changes in Civil 3D versus other drafting or design packages. The ability to change dramatically the display of objects with just a few clicks really makes it easy to repurpose information. You can create new uses for data that were previously more effort to produce than they were worth. Let’s look at a surface style to better understand some of the common components of an object style, and some of the power inherent in the applications of style.

1. Open the Exploring Object Styles drawing file. This file has a surface and a preconfigured set of viewports that will help you understand how object styles come into play in various view configurations.

2. Select View ➔ Viewports ➔ Named Viewports to display the Viewports dialog.

3. Select Exploring Styles from the Named viewports list on the left. Click OK to dismiss the dialog, and your screen should look something like Figure 1.12.

4. On the Settings palette, expand the Surface Branch, and then expand Surface Styles.

5. Right-click Contours 2’ and 10’ (Background) and select Copy to bring up the Surface Style dialog shown in Figure 1.13.

6. Click the Name field and change the name to Exhibits. Change the description to A style used for public meeting exhibits, and click Apply to see the changes. Note that the Last Modified By field now reflects your username.

7. Change to the Contours tab, and expand the Contour Smoothing option by clicking the plus sign next to it.
8. Change the Smooth Contours value to True. Remember, this is for meetings, not for plans, so displaying the contours is more about aesthetics than precision. Smoothing in a plan production situation is not generally recommended.

9. Change to the Analysis tab, and expand the Elevations options.

10. Change the Scheme to Land, the Number of Ranges to 12, and the Display Type to 3D Faces.

11. Change the Elevation Display Mode to Exaggerate Elevation, and then change the Exaggerate Elevations by Scale Factor to 5. The Analysis dialog should now look like Figure 1.14.
At this point, you’ve modified the way things will look when they’re turned on, but not the objects that are on and off. The Display tab is a common component to all object styles. It controls the display of individual components within an object, and how they are viewed in Civil 3D based on the viewpoint. This level of control allows you to have different representations of a single object in plan views and 3D (or Model as it’s used here) views.

12. Change to the Display tab. The View Direction drop-down menu on this tab offers three options for a surface: Plan, Model, and Section. We like the contours as handled in Plan, but let’s change what happens in 3D views.

13. Select Model from the list and note that the selections in the Component display area change, most notably in terms of what is visible in a given view. This is indicated by the lightbulb icon being on or off.

14. Click the bulb in the Triangles row and turn it off. Then click the bulb in the Elevations row to turn it on. The Display tab should now look like Figure 1.15.
15. Click OK to close the dialog, and you’ll see that Exhibits is now listed under your Surface Styles.

Building a style is all well and good, but until it’s applied, it’s hard to see any actual changes. Next, you’ll modify the surface to use your new style, and you’ll see the results of your work.

16. Change to the Prospector palette, and expand the Surfaces branch under the Exploring Object Styles drawing.

17. Right-click McKinney and select Surface Properties to display the Surface Properties dialog.

18. On the Information tab, select Exhibits from the Surface Styles drop-down list.

19. Click OK to close the dialog. Your screen will update to reflect the new colors assigned as part of the Elevations analysis. Each viewport will shift some, because the 5X exaggeration will cause the data to be higher in the z-axis than it was.

20. Click in each viewport and pan to recenter the surface in your view. When complete, it should look like Figure 1.16.

By using styles, you’ll be able to change the appearance of your Civil 3D model objects in an instant. Much as you changed the style of the Alignments in a prior section, you can change styles to reflect various modes and display requirements. Now, let’s discuss how you can label all these dynamic elements.

**Figure 1.16**

After assigning a new style, the 3D views have changed dramatically. (We closed Toolspace to make the image cleaner.)