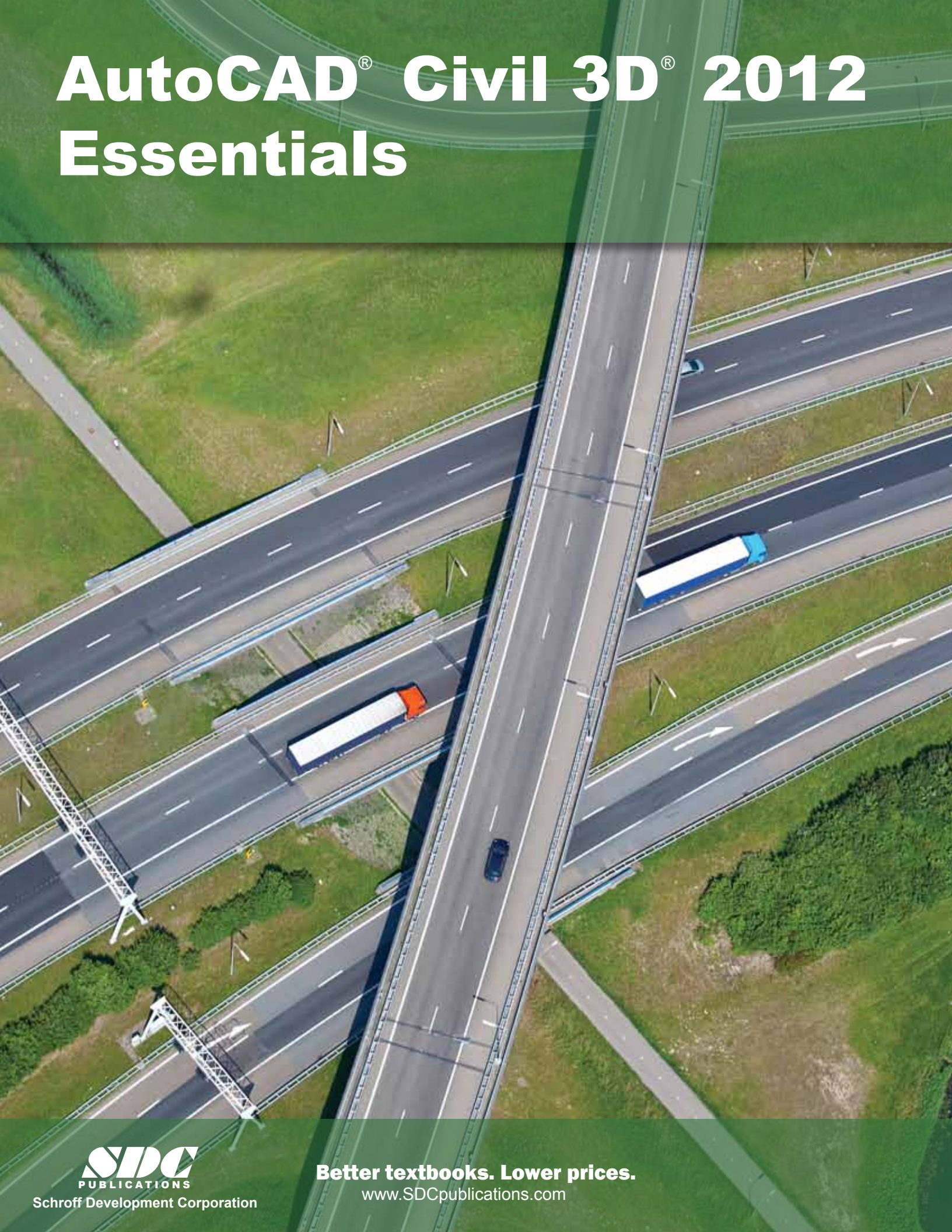


AutoCAD® Civil 3D® 2012 Essentials



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Module 2

Parcels Level 1

This module introduces:

Section 1: Parcels Overview

- ✓ **Introduction to Parcels**

Section 2: Subdividing Parcels

- ✓ **Creating and Editing Parcels by Layout Overview**
- ✓ **Creating and Editing Parcels**
- ✓ **Renumbering Parcels**

Section 3: Parcel Reports, Annotation, and Tables

- ✓ **Parcel Reports**
- ✓ **Parcel Labels**
- ✓ **Parcel Tables**

Section 1: Parcels Overview

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2.1 Introduction to Parcels

A Site under development, as shown in Figure 2–1, is the starting point for defining smaller parcels. The development's agreement or covenants determine the size, setback, and other criteria for the new parcels. If a parcel is residential, there could be restrictions affecting minimum parcel areas, setbacks, and where to locate a house. If it is a commercial property, there could be restrictions or specific mandates for access, traffic control, parking spaces, etc. The Parcel Layout commands are used for subdividing larger parcels.

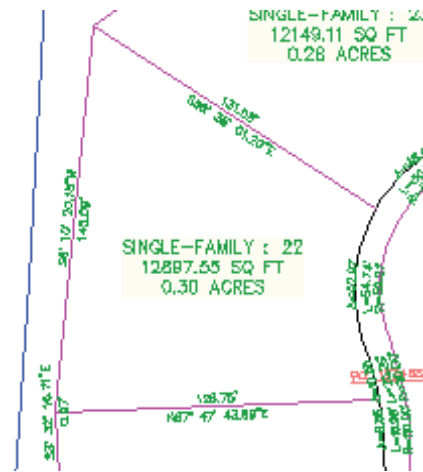


Figure 2–1

Sites, parcels, and alignments are closely related. Each can exist by itself and you do not need to have any alignments associated with the parcels. However, you often start with a site boundary and then divide the site into smaller parcels by placing alignments within its boundary.

- Parcels are listed in the *Prospector* tab in the Sites branch, as shown in Figure 2–2.

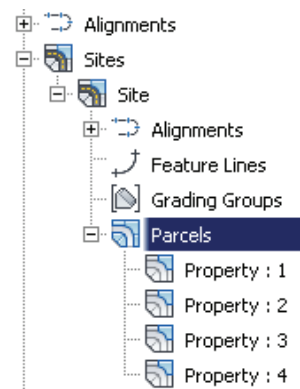


Figure 2–2

- When adding alignments to a site, the Parcels list is updated in the *Prospector* tab.
- As in all other AutoCAD® Civil 3D® objects, Parcel object layers are controlled in the Drawing Settings dialog box, *Object Layers* tab, as shown in Figure 2–3.

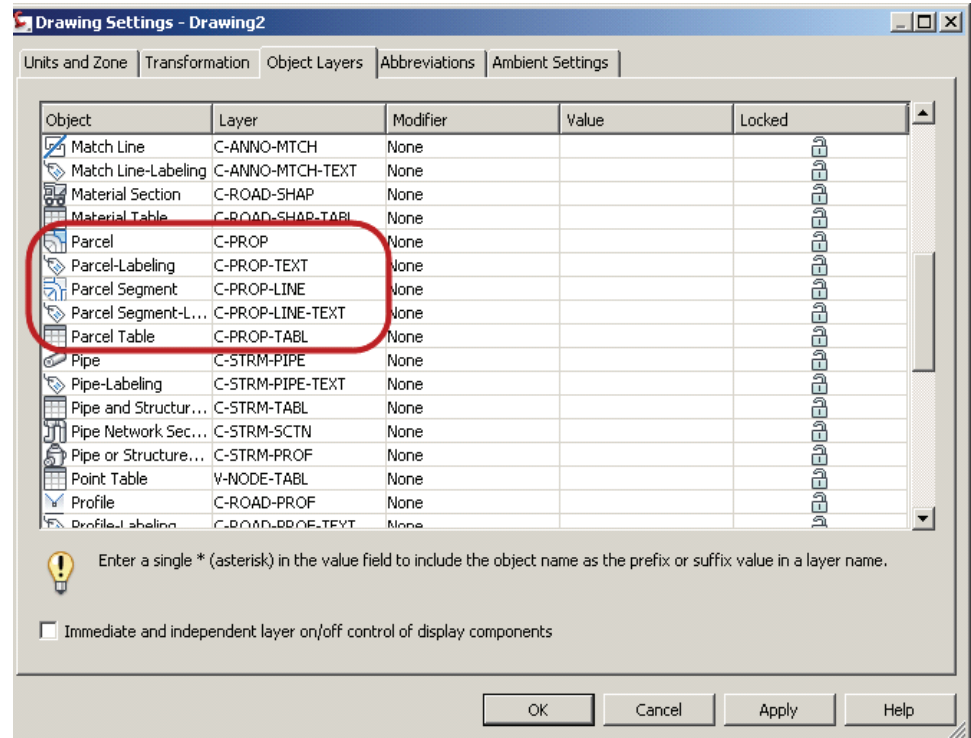


Figure 2–3

ROW Parcel

The right-of-way (ROW) parcel is related to the alignment and parcels. This special parcel represents land that is owned, maintained, and used for the community by a regulatory body (usually the local municipality). Typically, the ROW contains the road, sidewalks, and utilities. The contents of the ROW depend on the covenants or agreements made before the site is developed. For example, in some cases the sidewalks and utilities might be located in an easement outside of the road ROW.

- AutoCAD Civil 3D software contains a **ROW** command that creates a parcel using offsets from an alignment.
- A ROW parcel can represent the front yard definition of several potential parcels.

- While normal parcels automatically adjust to changes to an alignment, ROW parcels are static, as shown in Figure 2–4. Therefore, you should create ROW parcels only after settling on a final location for an alignment.

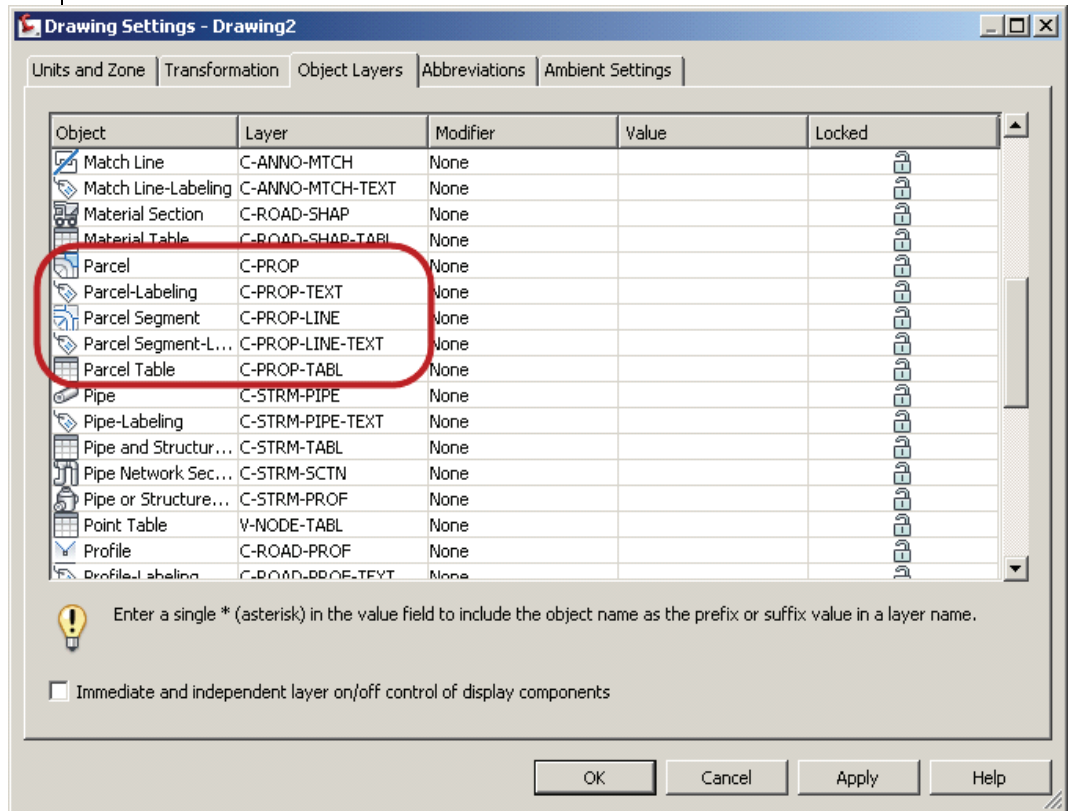


Figure 2–4

Parcel Style Display Order

Parcel segment display is controlled by parcel styles, and parcel lines can abut parcels with different styles. Select the **Parcels** collection (under *Sites*), right-click, and select **Properties**, as shown in Figure 2–5, to open the Site Parcel Properties dialog box. You can select which parcel style should take preference in the *Parcel style display order* area of the Site Parcel Properties dialog box, as shown in Figure 2–5. Placing the style for the overall parent tract (the Site Parcel Style) at the top of the list causes the outside parcel lines to display differently than those inside.

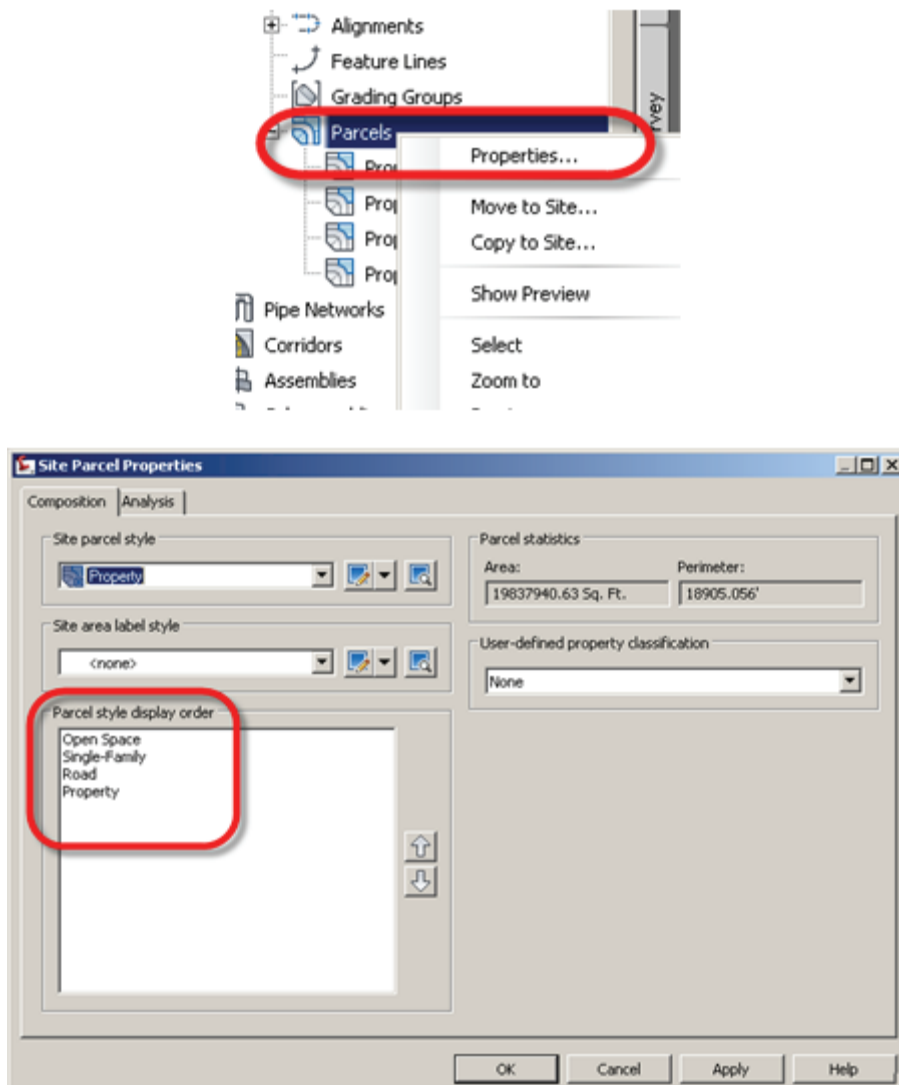


Figure 2–5

Parcel Properties

The properties of a parcel include its name, style, and an *Analysis* tab containing the parcel's area, perimeter, and point-of-beginning (POB). The Parcel Property's *Composition* tab shows the label style, area, and perimeter, as shown in Figure 2–6.

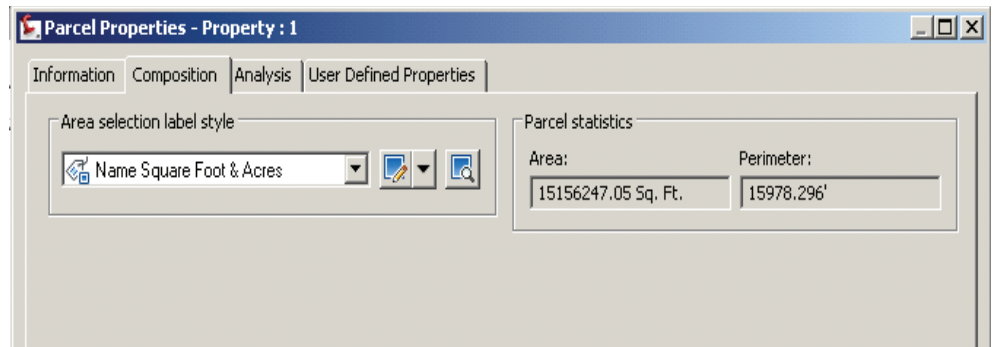


Figure 2–6

The *Analysis* tab contains a parcel boundary Inverse or Mapcheck analysis. In the upper right side of the tab, you can change the POB location and the analysis direction, as shown in Figure 2–7.

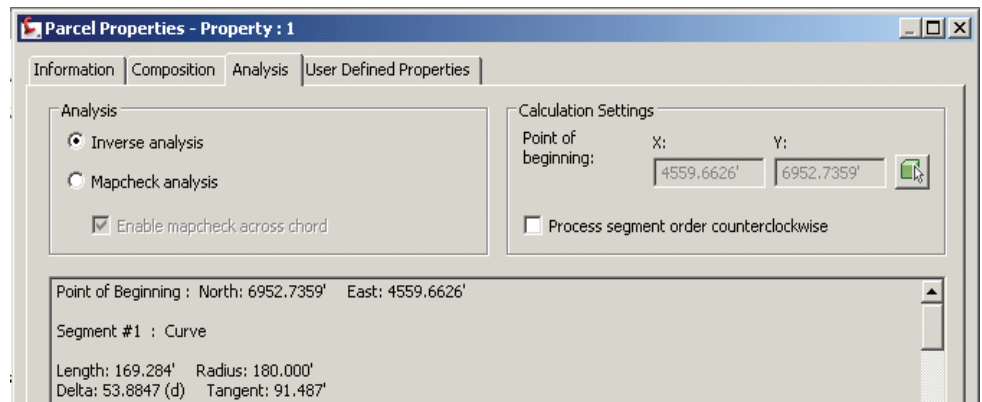


Figure 2–7

- The Mapcheck analysis precision is the same as the drawing distance precision.
- The Inverse report precision is set to the precision of AutoCAD Civil 3D (10-12 decimal places).
- The default direction of a Mapcheck or Inverse analysis is clockwise. You can change the direction to counter-clockwise, if needed.
- A POB can be any vertex on the parcel's perimeter.

The *User Defined Properties* tab contains site-specific details, such as the *Parcel Number*, *Parcel Address*, *Parcel Tax ID*, and other properties you might want to define, as shown in Figure 2–8. Custom properties can be assigned to a drawing through the *User Defined Property Classifications* section of the *Settings* tab, under the *Parcels* collection.

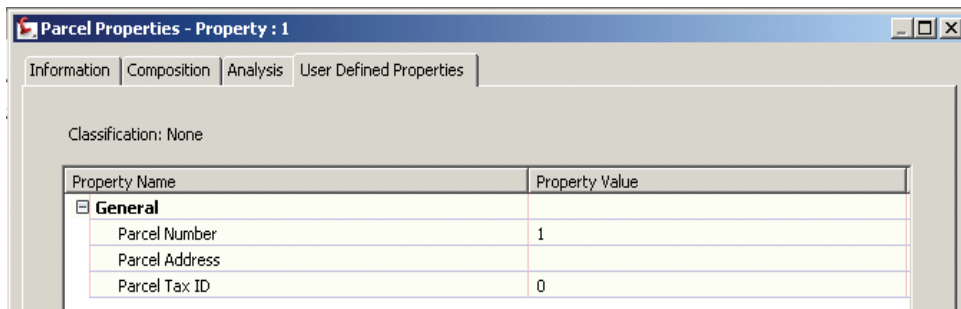


Figure 2–8

Parcel Labels and Styles

There are two types of parcel annotation: an area label for the parcel itself and the segments defining the parcel.

A parcel area label usually consists of a parcel's number or name, area, and perimeter, as shown in Figure 2–9. Most offices define their own parcel label styles. A parcel label style can include several additional parcel properties, address, PIN, Site name, etc. In AutoCAD Civil 3D, you graphically select a parcel by selecting a parcel area label, not parcel segments.



Figure 2–9

Create Parcels from Objects

AutoCAD Civil 3D program can create parcels from AutoCAD® objects, such as closed polylines and closed sequences of lines and arcs. Be careful to avoid gaps, multiple polyline vertices at the same location, and polylines that double-back over themselves, which might lead to errors in parcel layouts.

These objects can be selected in the current drawing or from an XREF. Keep in mind that AutoCAD Civil 3D parcel lines in an XREF cannot be selected—only lines, arcs, and polylines. Also note that AutoCAD Civil 3D parcels created from AutoCAD objects maintain no relationship to the objects after creation.

Creating Right-of-Way Parcels

Once a site has the property defined as a parcel and alignments are generated, you are ready to start creating subdivision plans. One command that can speed up the process is **Parcels > Create ROW**. This command automatically creates Right-of-Way parcels based on alignment setbacks.

Keep in mind that ROW parcels do not automatically update when alignments change. Therefore, you might want to create ROWs after you are fairly certain where you want the alignments to be for this alternative.

Hint: Multiple Alternatives in the Same Drawing

Sites enable you to organize alignments, parcels, and related data into separate containers, so that parcel lines from one site alternative do not clean up with parcel lines in others. However, sites do not offer layer or any other kind of visibility control. Therefore, if you intend to have multiple parcel layout alternatives in the same drawing, you should consider placing parcel area labels and parcel segments on different layers.

Practice 2a

Beginning a Subdivision Project

Task 1 - Create a Site parcel from objects and renumber parcels.

1. Open the file **PCL1-A1-Parcels.dwg** from one of the following folders:

Metric:

C:\Civil 3D Projects\Civil3D-training-M\Drawings\Parcels

Imperial:

C:\Civil 3D Projects\Civil3D-training-I\Drawings\Parcels

2. To make the annotation easier to read, change the current drawing scale. In the Status Bar, set the Annotation Scale to **1:1000 (M)** or **1:40 (I)**, as shown in Figure 2–10.

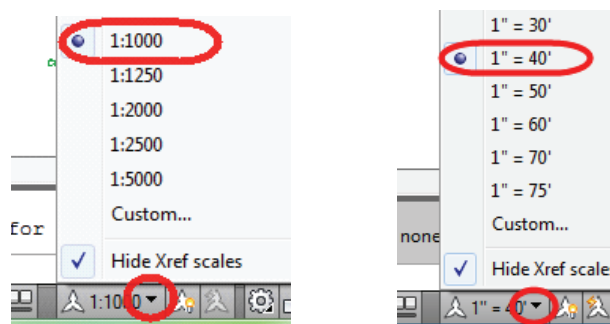


Figure 2–10

3. Create a parcel from existing objects in Model Space. In the *Home* tab > *Create Design* panel, select **Parcel > Create Parcels from Objects**, as shown in Figure 2–11.

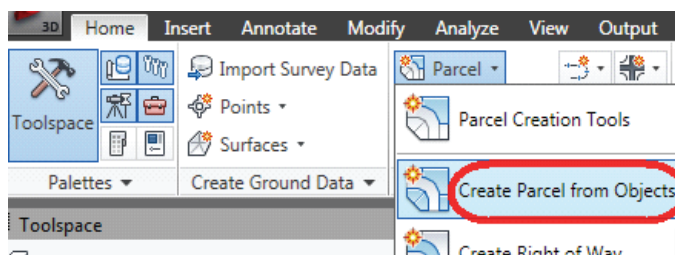
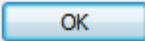


Figure 2–11

4. In the model, select all the objects that represent the property boundary and press Enter when done selecting. Set the following parameters:
 - Site: **Site 1**
 - Parcel style: **Property**
 - Area Label style: **Name Area & Perimeter**
 - Erase existing entities: Select this option.
5. Refer to Figure 2–12 for the remaining values, then click  to accept and close the dialog box.

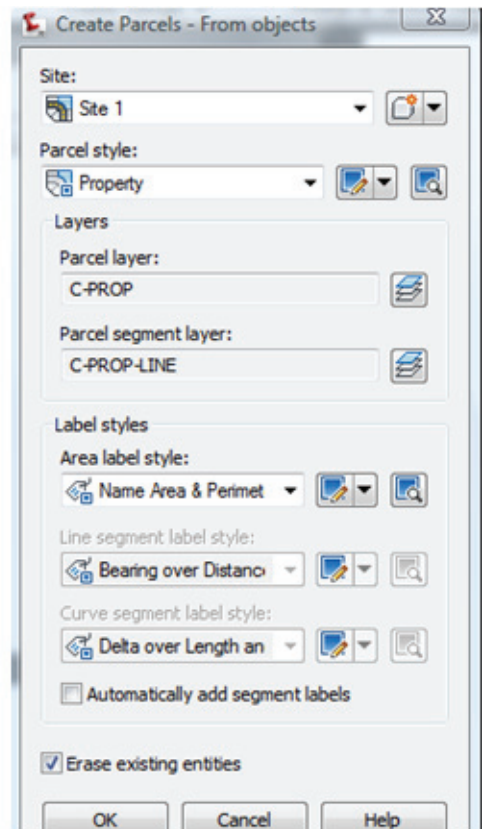
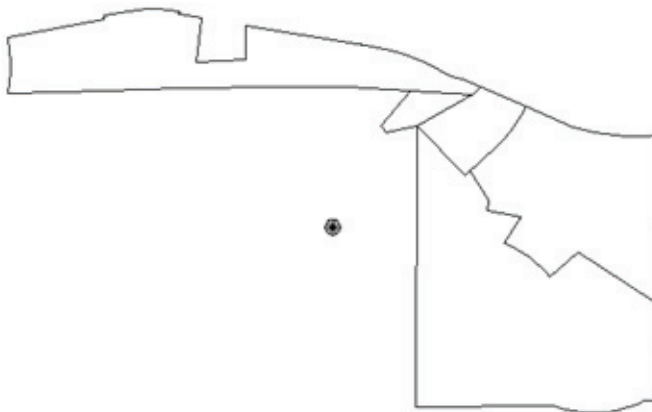


Figure 2–12

- Five parcels will be created. In the *Prospector* tab, expand the **current drawing branch**, as well as the **Sites** branch by selecting the + sign. Continue to expand until you reach the *Parcels* branch, as shown in Figure 2–13. **Note:** If the + is not showing next to *Parcels*, press the <F5> key to refresh the *Prospector* tab view.

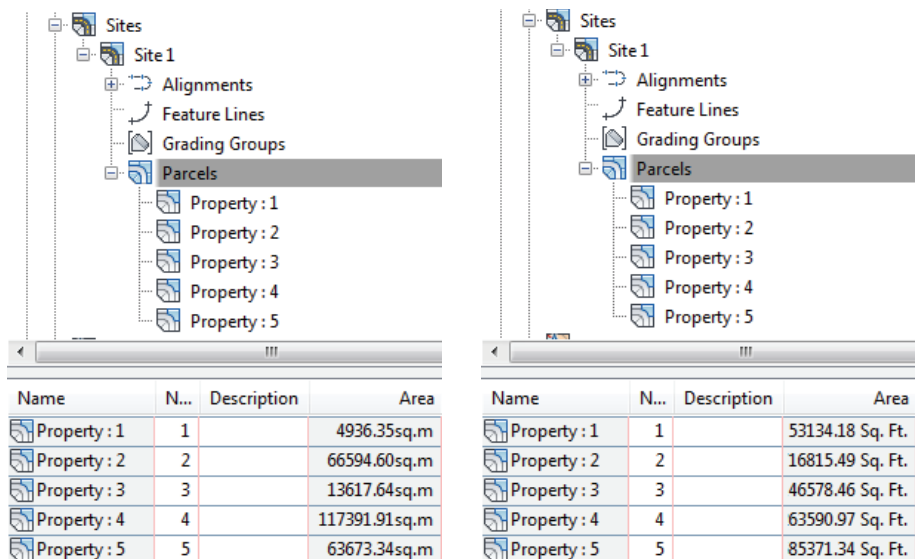


Figure 2–13

- Change the object style of the two parcels. In Model Space, select the parcels as shown in Figure 2–14. Select **Property:1** and in the *Parcel* tab > *Modify* panel, select top half of the **Parcel Properties** command. In the *Information* tab of the dialog box that opens, change the *Object style* to **Single-Family**. Verify that **Use name template in parcel style** is checked on. This enables you to rename the parcel with the style name. Click to close the dialog box and press <Esc> to clear the selection.

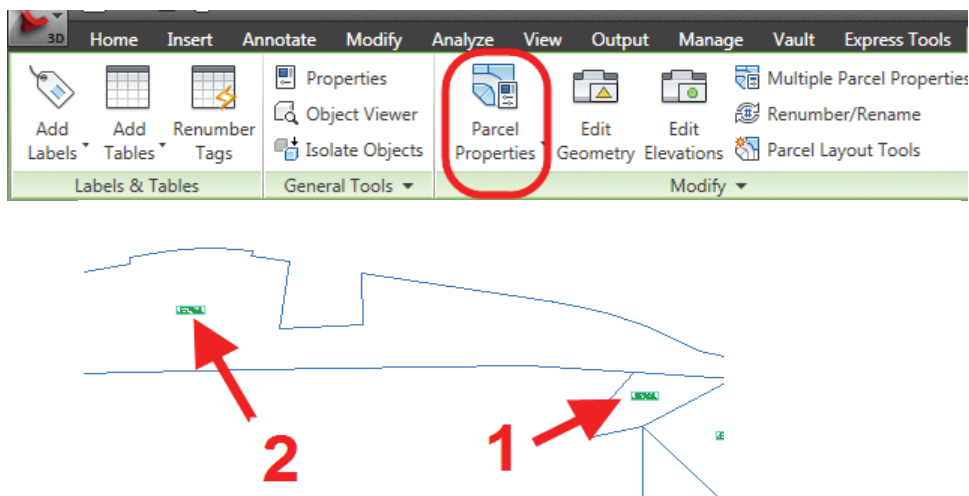


Figure 2–14

8. Repeat the previous step for **Property:2** and change the *Object style* to **Open Space**.
9. In the *View* tab > *Views* panel, select the preset view **C3D-Parcel-Split Parcel**. Alternatively, in the *Prospector* tab go to the *Sites* directory and open it. Right-click on the *parcels* folder and select **Refresh**. Select the **SINGLE-FAMILY : 1** parcel, right-click and select **Zoom**. This will zoom your view into this parcel in the Model Space.
10. Note the north boundary of the Single-Family parcel that shares the parcel line with the Open Space parcel displays this parcel line with the style assigned to the Open Space, as shown in Figure 2–15.

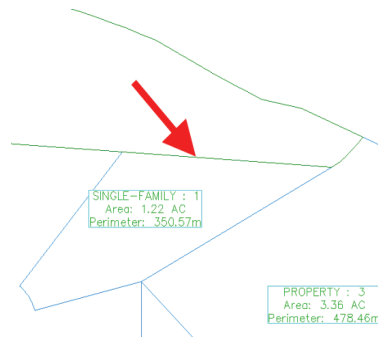


Figure 2–15

11. Display the Single-Family parcel so that its assigned style takes precedence over all other shared parcel line styles. In the *Prospector* tab, expand the *Sites* collection, and then the *Site 1* collection. Select the **Parcels** collection, right-click and select **Properties**.

12. In the Site Parcel Properties dialog box, select **Single-Family** in the Parcel style display order section, as shown in Figure 2–16.

Click  to move it up in the list.

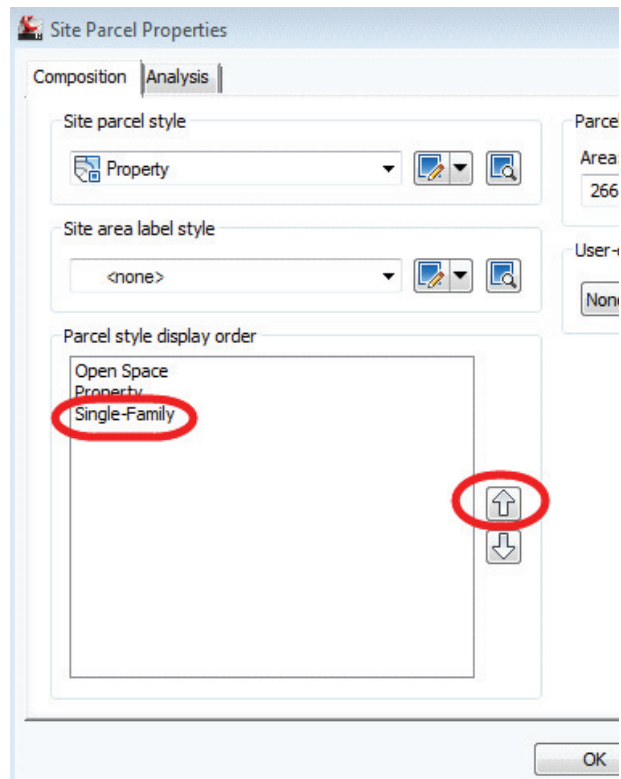
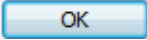


Figure 2–16

13. Click  to close the dialog box and save the drawing.

Task 2 - Split and Merge Parcels.

As part of the development, you will need to acquire or purchase a partition of land from Property 2 (Open Space:2) and Property 1 (Single-Family:1).

1. Continue working with the drawing from the previous task, or open the file **PCL1-A2-Parcels.dwg**.

- In the **View** tab > **Views** panel, select the preset view **C3D-Parcel-Split Parcel**, as shown in Figure 2–17. Alternatively in the *Prospector* tab open the *Sites* directory. Right-click on the *Parcels* folder and select refresh. Select the **Property: 1** parcel, right-click and select **Zoom**. This will zoom your view into this parcel in the Model Space.

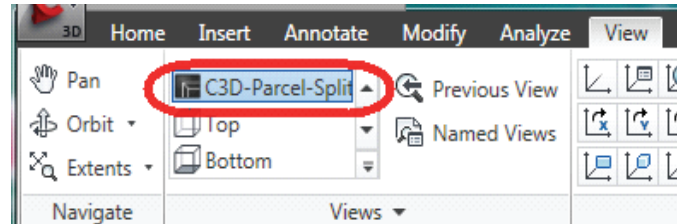


Figure 2–17

- You will extend the blue property line until it intersects the north green property line. Select the blue property line to display the grips. Select the grip and move it to the apparent intersection. Press <Ctrl>, right-click, and select **Apparent Intersection**. When prompted for apparent of, select **line 1** and then **line 2**, as shown in Figure 2–18. Press the <Esc> key to clear the selection.

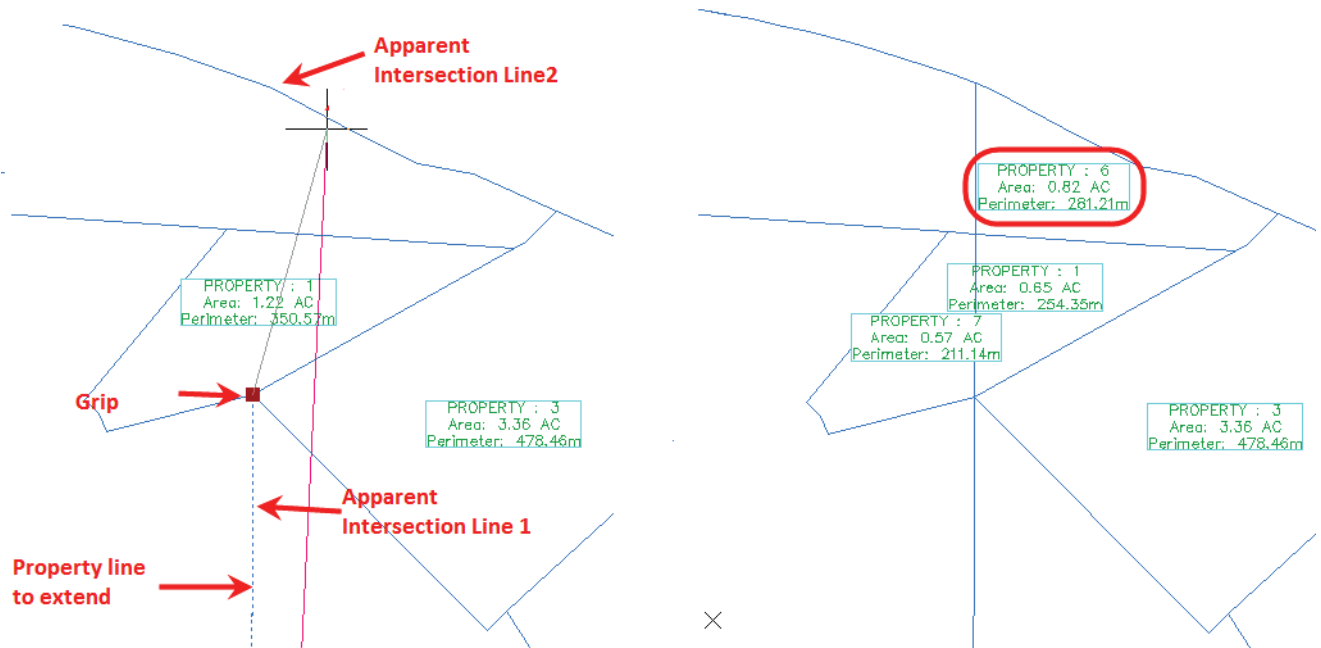


Figure 2–18

- Select the parcel label **Property:6** and in the contextual Ribbon, select **Parcel Properties**. In the Parcel Properties dialog box, select the *Analysis* tab and select the **Mapcheck analysis** option. Scroll down the list and you should see the *Error Closure* or *Precision*, as well as the total *Area*, as shown in Figure 2–19. This is the area of land you will need to purchase. Perform the same steps to determine the area you will need to purchase from the single-family lot.

Perimeter: 281.212m Area: 3337.05sq.m|
 Error Closure: 0.0001 Course: N5° 13' 24"W
 Error North: 0.00005 East: -0.00000
 Precision 1: 2812010.000

Perimeter: 922.608' Area: 35919.54 Sq. Ft.
 Error Closure: 0.0011 Course: N34° 02' 28"W
 Error North: 0.00092 East: -0.00062
 Precision 1: 838700.000

Figure 2–19

- To create one parcel based on your development site, you have to erase and modify all property lines that split the site. Since you are performing a land transfer of Single-Family:1 and Property:6 to the main parcel site, you need to adjust the property line that divides the two parcels. Click **OK** to close the dialog box and press <Esc> to clear the selection.
- Select the north property line to display the grips. Select the east grip and move it to the intersection. Press <Ctrl>, right-click, and select **Intersection**. When prompted for intersection of, select **Intersection Pt**, as shown in Figure 2–20. Press <Esc> to clear the selection.

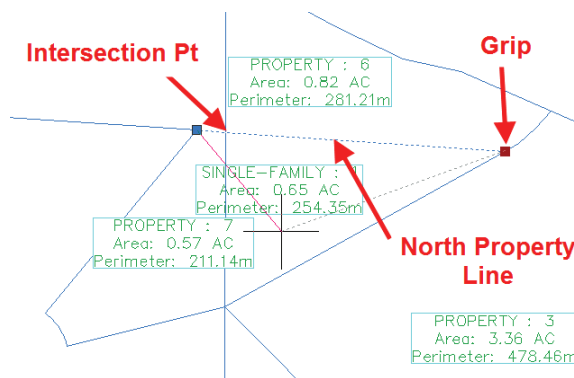


Figure 2–20

7. Use the AutoCAD **Erase** command to erase all of the internal property lines, as shown in Figure 2–21.

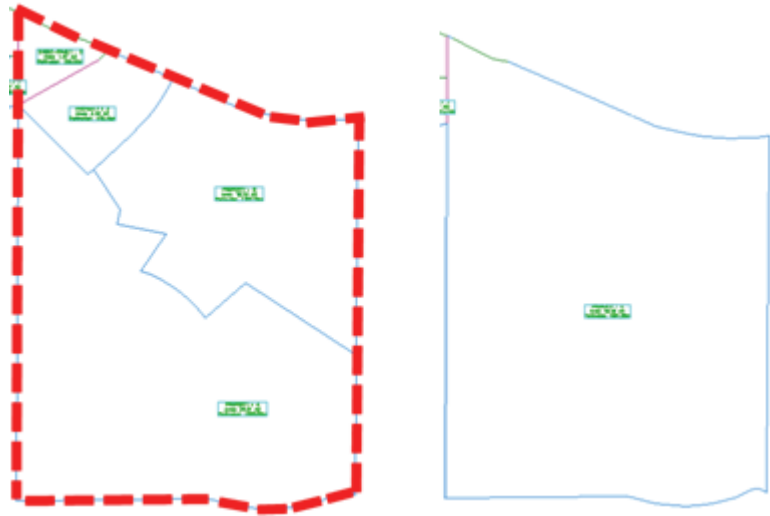


Figure 2–21

8. You will now only have three properties. Rename them to relevant names. Type **ZE** and press <Enter> at the Command Line for Zoom Extents. In the Status Bar, enable the Quick Properties icon, as shown in Figure 2–22.



Figure 2–22

9. Select the **Open Space:2** property (at the west end) and in the Quick Properties dialog box, change the *Name* to **Private AR** (agricultural reserve), and leave the *Style* as **Open Space**, as shown in Figure 2–23. Press <Esc> when finished.

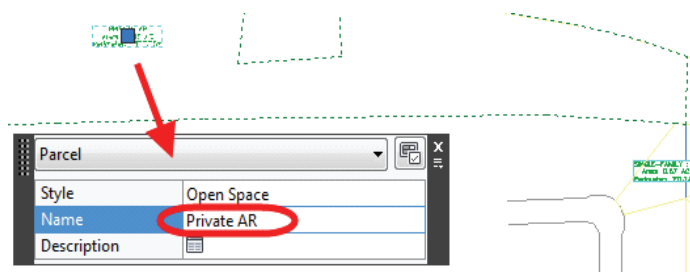


Figure 2–23

10. Select the pie-shaped parcel located in the middle area between the two parcels. Rename it to **Single Family R1** and enter **Single-Family** for the *Style*, as shown in Figure 2–24. Press <Esc> when done.

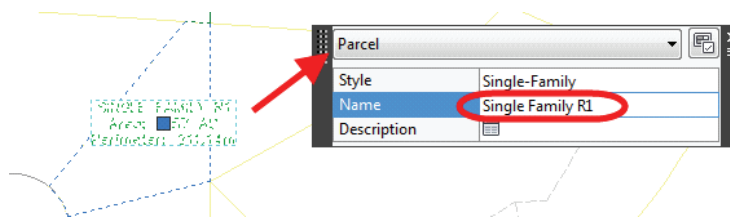


Figure 2–24

11. Select the main parcel that is to the east. Rename it to **Main Property** and enter **Property** for the *Style*.
12. You may have to refresh the Parcels collections in the Prospector. Expand the sites collection, expand the Site 1 collection, right click on the parcel collection and select **Refresh**.

Task 3 - Create a new Site and Site parcel from referenced objects.

You have received a drawing from the Land planning department that shows the street layout and different parcels. Using this plan, you will create parcels from a xref objects.

1. Continue working with the drawing from the previous task or open the file **PCL1-A3-Parcels.dwg**.
2. Create a new site branch where you can store all parcels that are relevant to the Main development site. In the *Prospector* tab, right-click on the Sites branch and select **New**. Enter **C3D**

Training as the name and click  to close the dialog box.

7. Use the AutoCAD **Erase** command to erase all of the internal property lines, as shown in Figure 2–21.

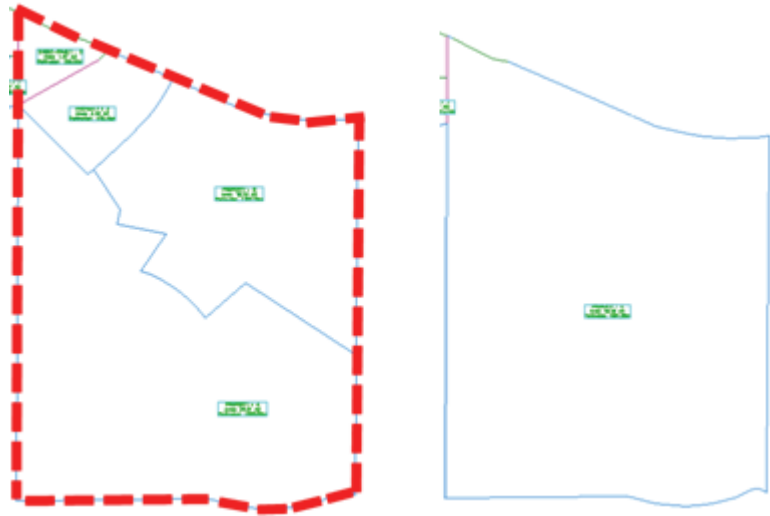


Figure 2–21

8. You will now only have three properties. Rename them to relevant names. Type **ZE** and press <Enter> at the Command Line for Zoom Extents. In the Status Bar, enable the Quick Properties icon, as shown in Figure 2–22.



Figure 2–22

9. Select the **Open Space:2** property (at the west end) and in the Quick Properties dialog box, change the *Name* to **Private AR** (agricultural reserve), and leave the *Style* as **Open Space**, as shown in Figure 2–23. Press <Esc> when finished.

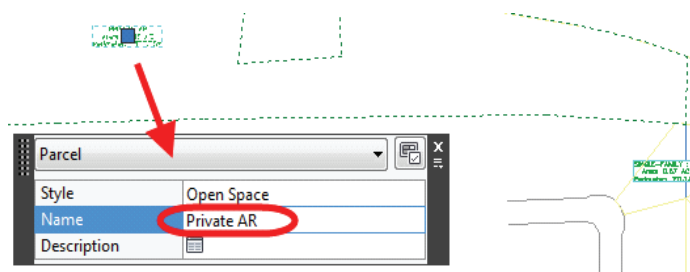


Figure 2–23

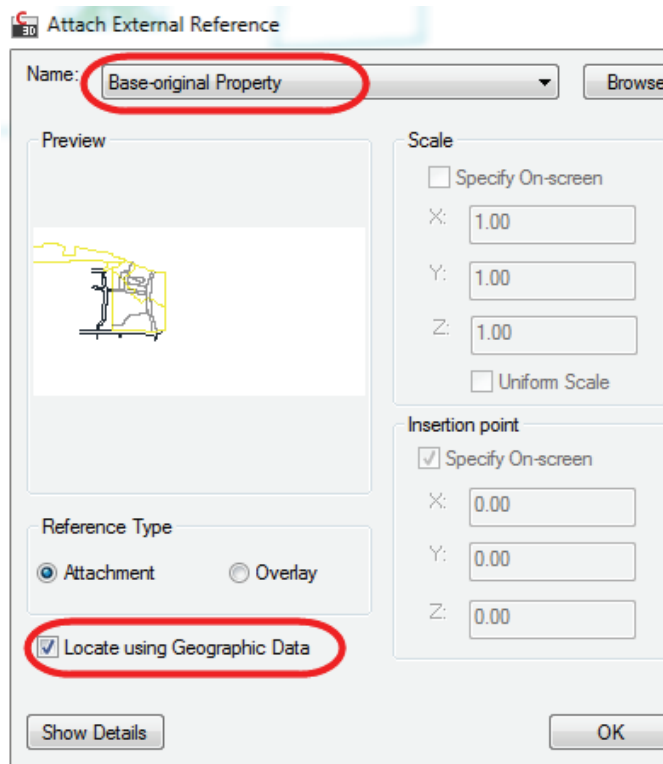
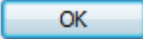


Figure 2–26

5. Enable a preset view by selecting the *View* tab in the Ribbon and in the Views panel, select the **C3D-Parcel-Xref** preset view.
6. To create parcels from the x-referenced file. In the *Home* tab > Create Design panel, select **Parcel > Create Parcels from Objects**. Type **X** (for **xref**) <Enter> at the Command Line.
7. When prompted to select the xref objects, type **WP** (for window poly) <Enter> at the Command Line. Draw a boundary that encompasses all of the polylines that define the internal site, as shown on the left of Figure. Once you are finished defining the boundary, end the WP selection command by pressing <Enter>. Press <Enter> again to end the xref selection command.
8. In the Create Parcels - From objects dialog box, ensure that the Site name is **C3D Training** and accept the remaining defaults, as shown on the right in Figure 2–27. Click  to close the dialog box.

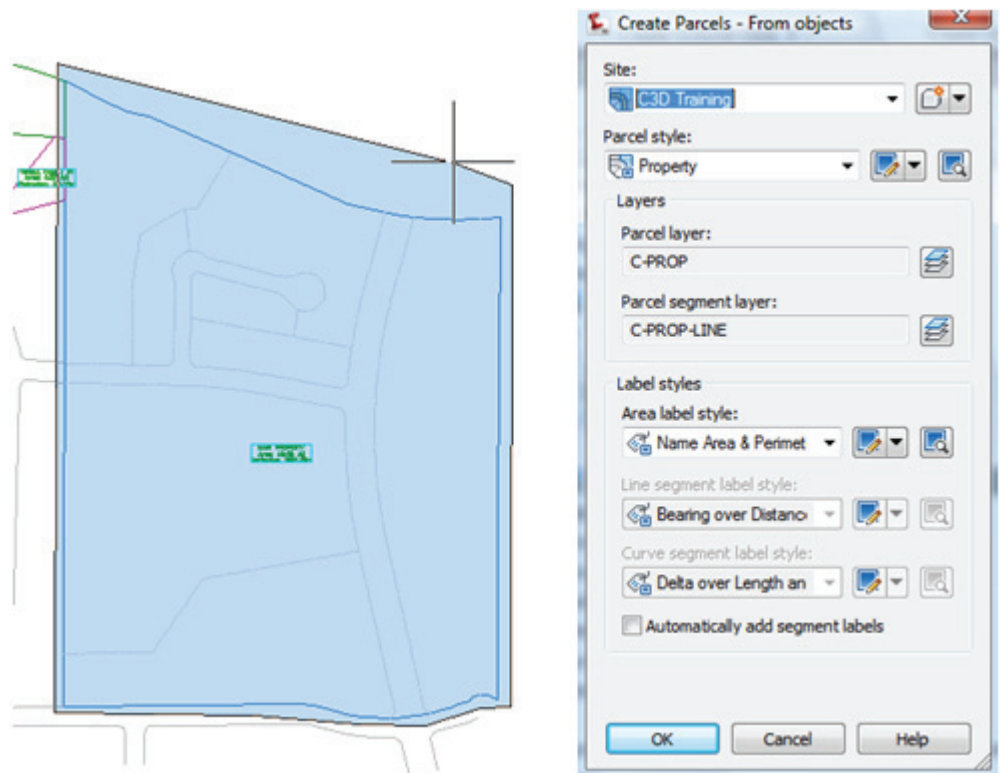


Figure 2-27

9. The project site has nine parcels. Using the quick properties dialog box, select each of the parcel labels and rename the parcels according to Figure 2-28.

1. Commercial C1
2. Multi Family MF
3. Municipal Reserve MR
4. Pond PUL
5. Residential BLK2 R1
6. Residential BLK1 R1
7. Residential BLK3 R1
8. Right Of Way
9. School MSR

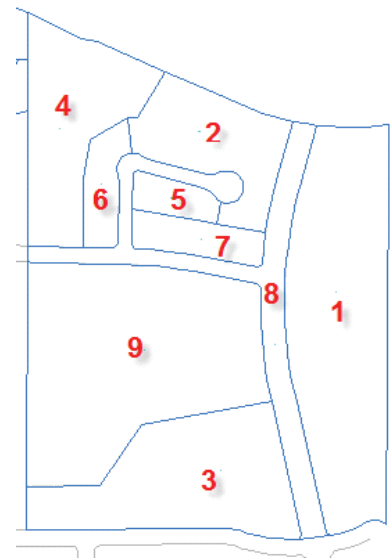


Figure 2-28

10. Save the drawing.

Review Questions

- Question 1** Where are parcels listed?
- Question 2** What does the ROW contain?
- Question 3** What does a parcel style assign in the Display tab?
- Question 4** What is the default direction of a Mapcheck or Inverse report?
- Question 5** How do you adjust parcel display order?

Section 2: Subdividing Parcels

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2.2 Creating and Editing Parcels by Layout Overview

In addition to creating parcels from polylines, arcs, and lines, AutoCAD Civil 3D can also intelligently create (and adjust) parcels using commands in the Parcel Layout Tools toolbar. To open the Parcel Layout Tools toolbar, click the down arrow next to the **Parcel** icon on the Create Design panel, and select **Parcel Creation Tools** in the drop-down list, as shown in Figure 2–29.

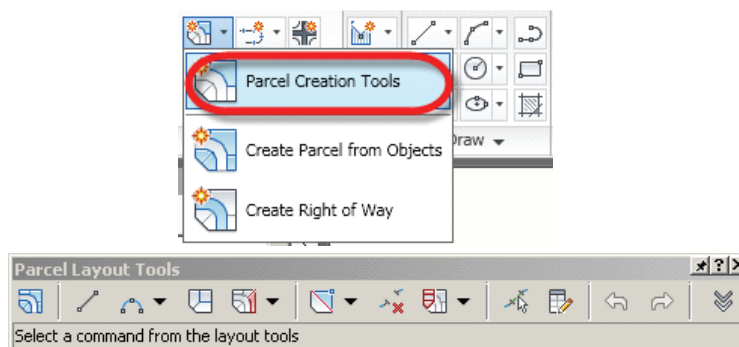





Figure 2–29

-  (Create Parcel) assigns parcel creation settings, such as parcel type, labeling styles, and other parameters.
- The **Line** and **Curve** commands () can be used to create individual line and curve parcel segments. Segments created with these tools are considered *fixed* (see the *Alignment* course material for a definition of the fixed vs. free or floating segment types).
-  (Draw Tangent - Tangent with No Curves) enables you to create a series of connected parcel line segments.

- The Parcel Sizing flyout, as shown in Figure 2–30, contains a list of commands for creating and editing parcels. The methods used to create parcels include defining the last parcel segment by slide direction, slide angle, swing line, or freehand drawing of a parcel boundary. The most frequently used method is **Slide Line**.

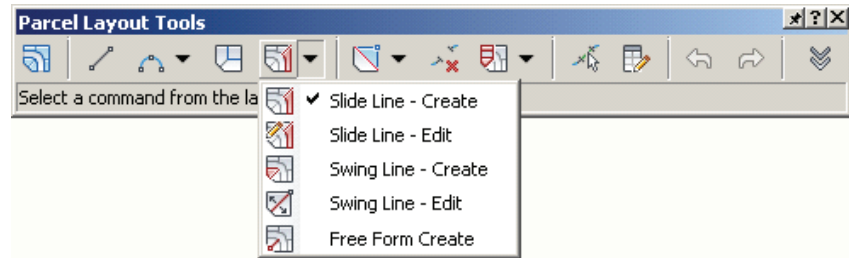


Figure 2–30

- The commands at the center of the toolbar, as shown in Figure 2–31, enable you to further edit parcel segments. These commands include inserting or deleting PIs (points of intersection), deleting parcel segments, or creating or dissolving parcel unions.

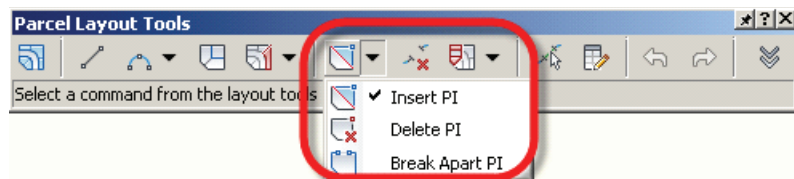





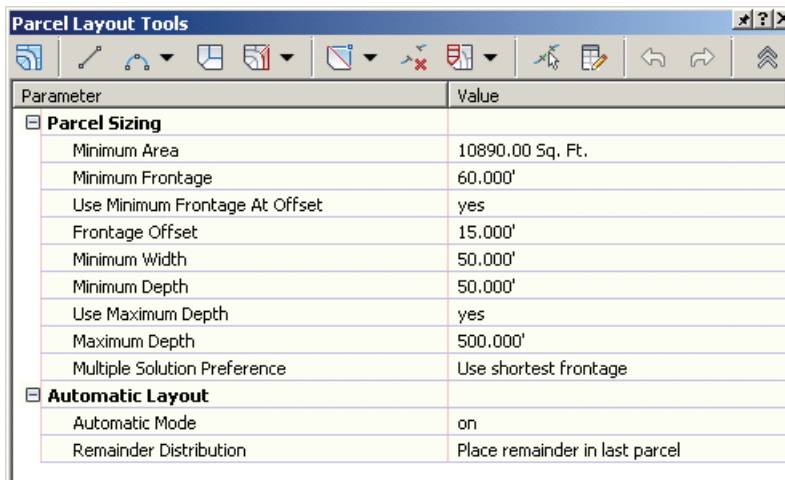


Figure 2–31

-  (Pick Sub-Entity) enables you to select a parcel line and view its details in the Parcel Layout Parameters dialog box.
-  (Sub-entity Editor) opens and closes the Parcel Layout Parameters dialog box.
- The next two commands enable you to **Undo** and **Redo** parcel edits ( ). These can be executed while the Parcel Layout Tools have been opened.

- The drop-down arrow () expands the toolbar to show the Parcel Creation parameters, as shown in Figure 2–32 (also accessible through the Command Settings of *CreateParcelByLayout* in the *Settings* tab).



Parameter	Value
Parcel Sizing	
Minimum Area	10890.00 Sq. Ft.
Minimum Frontage	60.000'
Use Minimum Frontage At Offset	yes
Frontage Offset	15.000'
Minimum Width	50.000'
Minimum Depth	50.000'
Use Maximum Depth	yes
Maximum Depth	500.000'
Multiple Solution Preference	Use shortest frontage
Automatic Layout	
Automatic Mode	on
Remainder Distribution	Place remainder in last parcel

Figure 2–32

- The *Parcel Sizing* section sets the minimum area for parcels to be laid out. The *Minimum Frontage* sets the minimum width of a parcel at the ROW or at a setback from the ROW.
- The *Use Minimum Frontage At Offset* specifies whether or not to use frontage offset criteria.
- The *Frontage Offset* sets the default value for the frontage offset from the ROW.
- The *Minimum Width* sets the default minimum width at the frontage offset.
- The *Minimum Depth* sets the minimum depth of new or existing parcels at the mid-point and is perpendicular to the frontage of the parcel.
- The *Use Maximum Depth* specifies whether or not to use maximum depth criteria.
- The *Maximum Depth* sets the maximum depth for new parcels or when editing parcels.
- The *Multiple Solution Preference* specifies whether or not to use the shortest frontage or the smallest area when multiple solutions are encountered.
- The *Automatic Layout* section affects how parcel auto-sizing subdivides a parcel block.

2.3 Creating and Editing Parcels

The Create Parcel by Layout tools can quickly help you create a subdivision plan. Although these tools can make your job easier and are faster than manual drafting, they are only effective in creating the last side of new parcels. In other words, you might need to create additional (or adjust) parcel lines manually to guide AutoCAD Civil 3D to the best solution. The area shown in Figure 2–33, for example, requires you to create minimum 950 sq m (10,225 sq ft) parcels.

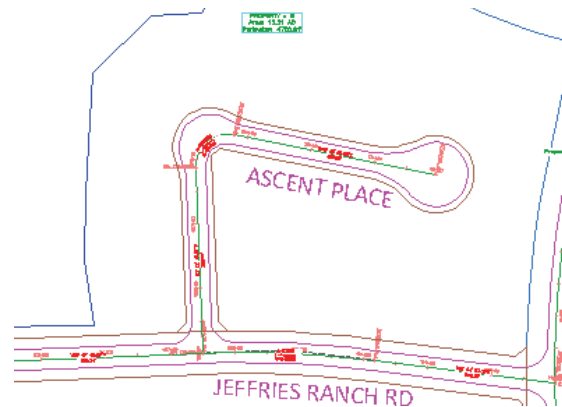


Figure 2–33



The back parcel lines (those along the west and south of the Cul-De-Sac area, and between Jeffries Ranch Rd and Ascent Place) were drawn manually and saved in a separate drawing file. Once inserted, they will be used to guide the creation of the parcels adjacent to Ascent Place. If you ask AutoCAD Civil 3D to automatically subdivide this area, the result is a total of 15 residential lot parcels, as shown in Figure 2–34.



Figure 2–34

Freehand

The various creation and editing techniques available in the Create Parcel by Layout toolbar are described below.

The **Line** and **Curve** commands () and  (Draw Tangent - Tangent with No Curves) command enable you to create lot lines without having to specify an area. In contrast, the commands below all create parcels based on a specified area.

Slide Line

The **Slide Line - Create** command enables you to subdivide a larger parcel by creating new parcel lines that hold a certain angle relative to the Right-of-Way, such as 90° or a specific bearing or azimuth. The **Slide Line - Edit** command enables you to modify a parcel to a specified area while holding the same angle from the ROW or a specific bearing or azimuth. They are shown in Figure 2–35.

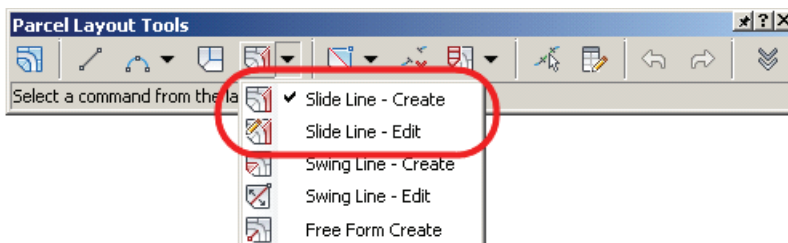


Figure 2–35

Swing Line

The **Swing Line - Create** command enables you to create a new parcel by creating a parcel segment that connects to a specified point, such as a property corner. The **Swing Line - Edit** command enables you to resize a parcel while specifying a lot corner. These commands are shown in Figure 2–36.

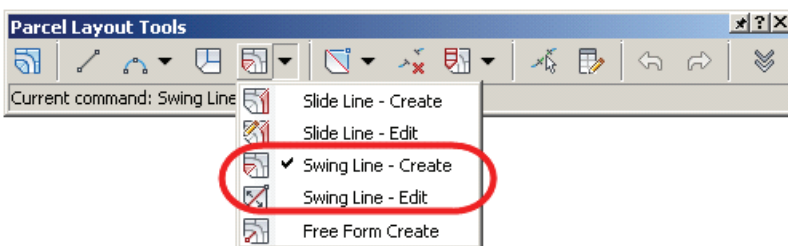


Figure 2–36

Free Form Create

The **Free Form Create** command enables you to create a new lot by specifying an area, an attachment point and angle, or two attachment points.

Frontage

When using these routines, you are prompted to select a parcel interior point and trace its frontage geometry. This is a critical step. As you trace the frontage, the command creates a jig (heavy highlight) that recognizes the changing geometry of the frontage line work.

2.4 Renumbering Parcels

Creating parcels using the methods explained in the previous examples results in inconsistent parcel numbering. AutoCAD Civil 3D parcels can be renumbered individually using Parcel Properties, or in groups using **Modify > Parcel > Renumber/Rename**.

This command enables you to specify a starting parcel number and the increment you would like between parcels. (It also enables you to rename your parcels based on a different name template.) When renumbering, the command prompts you to identify parcels in the order in which you want to have them renumbered. The Renumber/Rename Parcels dialog box is shown in Figure 2–37.

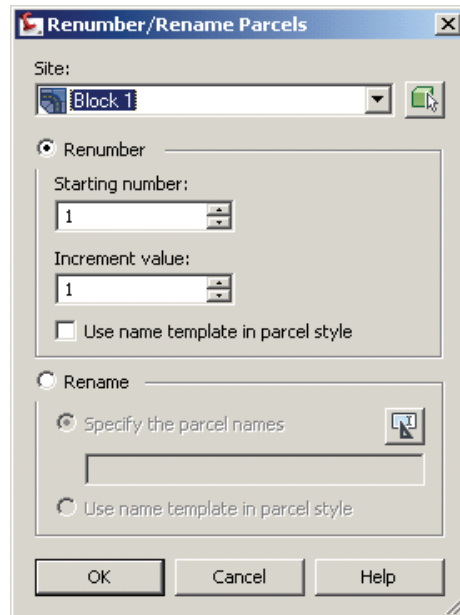


Figure 2–37

Practice 2b

Creating and Editing Parcels

You have three parcels zoned as single-family residential: Block 1 (1.31ac), Block2 (0.94ac), and Block3 (1.47ac). Your client, the land developer, requires you to maximize the number of lots in these three parcels, keeping in mind the minimum area and frontages as required by the Land Use bylaws.

Task 1 - Create parcels by slide angle.

1. Continue working with the drawing from the previous practice or open the file **PCL1-B1-Parcels.dwg** from one of the following folders:

Metric:

C:\Civil 3D Projects\Civil3D-training-M\Drawings\Parcels



Imperial:

C:\Civil 3D Projects\Civil3D-training-I\Drawings\Parcels

2. In the *View* tab > *Views* panel, select the preset view **C3D-Parcel-Create parcel**.
3. In the *Home* tab > *Create Design* panel, select **Parcel > Parcel Creation Tools**. The Parcel Layout Tools toolbar is displayed, as shown in Figure 2–38.




Figure 2–38

4. Click  and enter the values shown in Figure 2–39. As you enter each value, notice the graphics below in the dialog box. They visually identify what the values you enter are used for. When done click  to collapse the expanded toolbar.

Parcel Sizing	
Minimum Area	950.00sq.m
Minimum Frontage	20.000m
Use Minimum Frontage At Offset	Yes
Frontage Offset	6.000m
Minimum Width	20.000m
Minimum Depth	6.000m
Use Maximum Depth	Yes
Maximum Depth	1500.000m
Multiple Solution Preference	Use shortest frontage
Automatic Layout	
Automatic Mode	On
Remainder Distribution	Place remainder in last parcel

Parcel Sizing	
Minimum Area	10225.00 Sq. Ft.
Minimum Frontage	65.000'
Use Minimum Frontage At Offset	Yes
Frontage Offset	20.000'
Minimum Width	65.000'
Minimum Depth	20.000'
Use Maximum Depth	Yes
Maximum Depth	4925.000'
Multiple Solution Preference	Use shortest frontage
Automatic Layout	
Automatic Mode	On
Remainder Distribution	Place remainder in last parcel

Figure 2–39

5. In the Parcel Layout Tools toolbar, expand  and select **Slide Line - Create**, as shown in Figure 2–40.

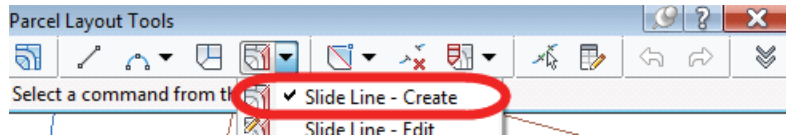


Figure 2–40

6. In the Create Parcels - Layout dialog box, set the following parameters, as shown in Figure 2–41:
- Site: **C3D Training**
 - Parcel style: **Single-Family**
 - Area label style: **Parcel Name - Area**

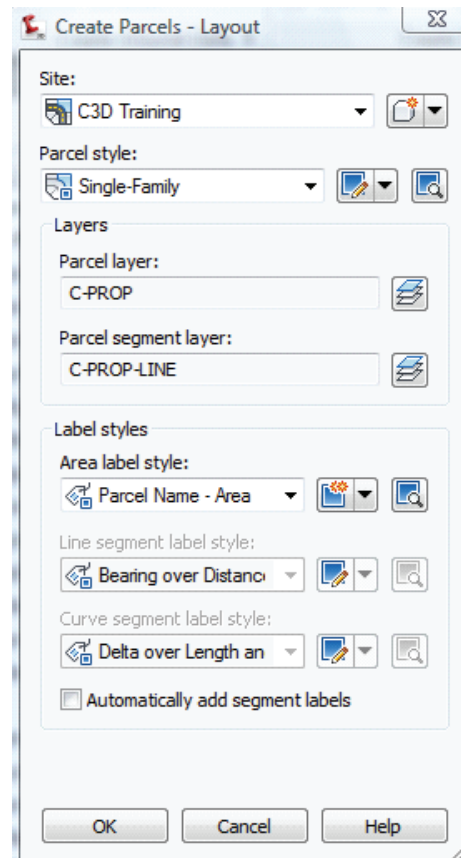
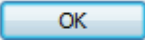


Figure 2–41

7. Click  to accept the changes and close the dialog box.
8. When prompted to select the parcel to be subdivided, select the label for parcel **RESIDENTIAL BLK1 R1**, as shown in Figure 2–42.

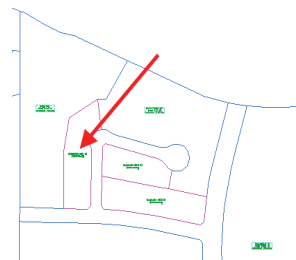


Figure 2–42

9. When you are prompted for the *starting point on frontage*, select the south end of the corner cut. Press the <Ctrl> key, right-click, and select **endpoint**. Then select the corner cut, Pt1, shown in Figure 2–43.
10. When prompted for the *end point of the frontage*, set the end point of the property line to the north, Pt 2, as shown in Figure 2–43. Use the same process as the previous step to set the end point.
11. When prompted for the *angle of the property line* that will be used to define each lot, select a point east of the parcel near Pt 3, shown in Figure 2–43. For the second point, press the <Ctrl> key, right-click, and select **Perpendicular**. Then select the line at Pt 4.

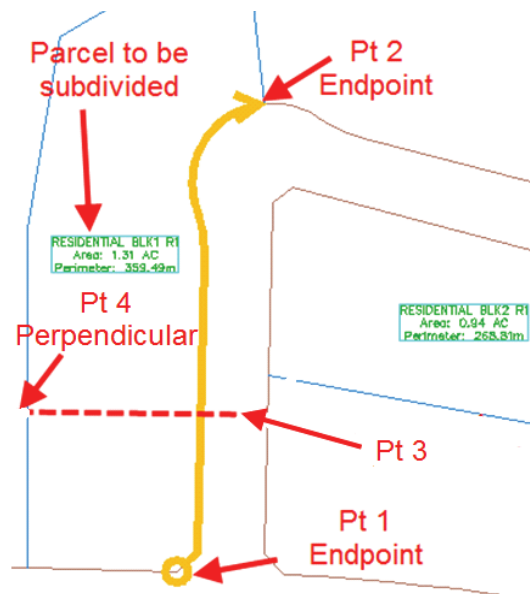


Figure 2–43

12. When prompted to *Accept results*, press <Enter>.
13. When prompted to select another parcel to subdivide, press <Enter> to end the command.
14. Enter **X** at the Command Line to exit the layout tool.
15. Save the drawing.

Task 2 - Rename and renumber parcels.

1. Continue working with the drawing from the previous task, or open the file **PCL1-B2-Parcels.dwg**.

2. In the *View* tab > *Views* panel, select the preset view **C3D-Parcel-Create parcel**.
3. Before renaming the newly created parcels, you first have to change the label style of the original parcel. Select the parcel label **RESIDENTIAL BLK1 R1**, right click, and select **Edit Area section Label Style**. Select **Parcel Name - Area** as the style and click **OK** to apply the changes and close the dialog box, as shown in Figure 2–44.

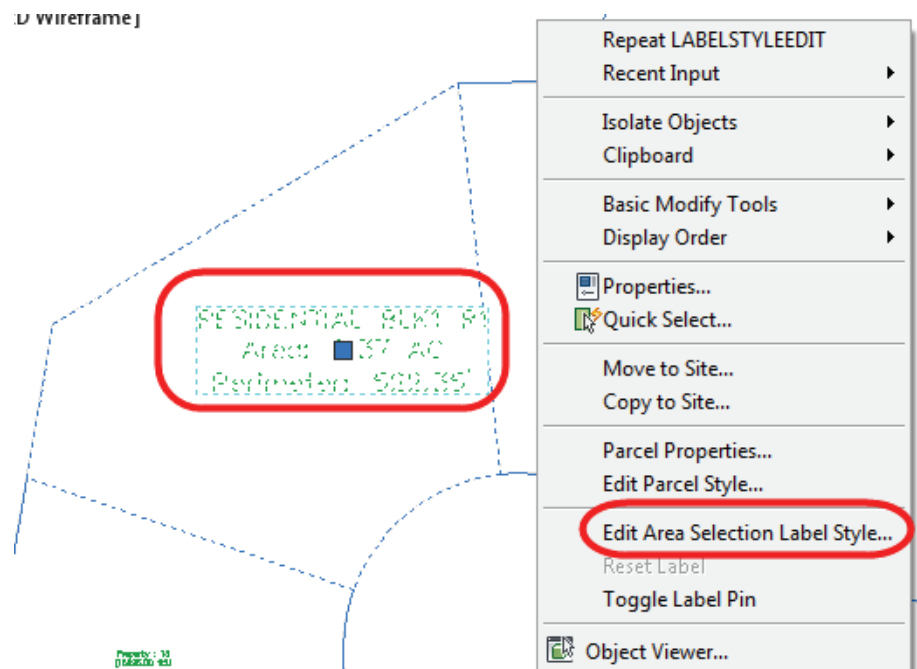


Figure 2–44

4. Rename and renumber the lots so that you have the same numbering system. In the *Modify* tab > *Design* panel, select **Parcel**. This displays the *Parcel* Ribbon tab.
5. In the *Parcel* tab > *Modify* panel, select **Renumber/Rename**, as shown in Figure 2–45.

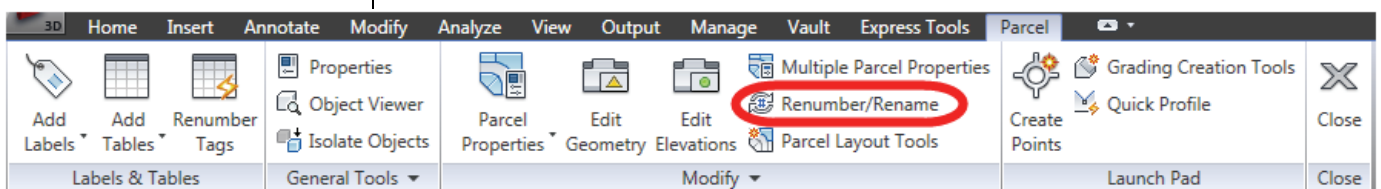



Figure 2–45

6. In the Renumber/Rename Parcel dialog box, select the **Rename** option. Select the **Specify the parcel names** option and click

 , as shown in Figure 2–46.

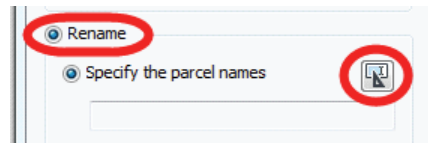
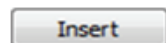


Figure 2–46

7. In the Name Template dialog box, enter **BLK1-Lot** with a space after it in the *Name* field, as shown in Figure 2–47. Select **Next Counter** in the *Property Fields* drop-down list and click

 . Click  to apply the changes and close the dialog box.

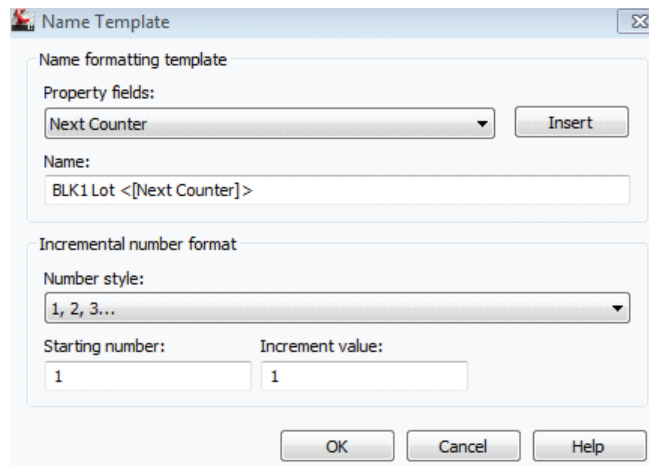
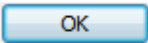


Figure 2–47

8. In the Renumber/Rename Parcel dialog box, click  to accept the changes and close the dialog box.

9. When prompted for the points, select all of the parcels to be renumbered. Select the three points shown in Figure 2–48 and press <Enter> to complete the selection. Press <Enter> again to exit the command.



Figure 2–48

10. Save the drawing.

Task 3 - Edit parcels using Swing Line - Edit.

In this task, you adjust the last three lots of the parcel (or lotting plan) so that they are more marketable.

1. Continue working with the drawing from the previous task, or open the file **PCL1-B3-Parcels.dwg**.
2. You first want to adjust the Lot line between Parcel 3 and Parcel 4. In the *Home* tab > Create Design panel, select **Parcel**. In the expanded list select **Parcel Creation Tools**.
3. In the Parcel Layout Tools toolbar, select **Swing Line - Edit**, as shown in Figure 2–49.

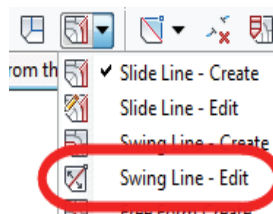


Figure 2–49

4. In the Create Parcel - Layout dialog box, set the following parameters, as shown in Figure 2–50:

- Site: **C3D Training**
- Parcel Style: **Single-Family**
- Area Label style: **Parcel Name - Area**

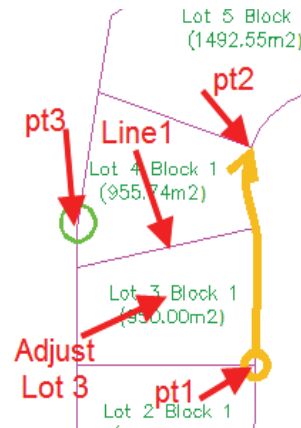




Figure 2–50

5. At this point, you do not want to label segments so do not enable this option. Click when done.
6. When prompted to select the parcel line to adjust, select the parcel line between Lot 3 and Lot 4.
7. When prompted for the parcel to adjust, select Lot 3.
8. When prompted for the *start frontage*, select the bottom right corner of Lot 3, pt1. When prompted for the *end of the frontage*, select the top right corner of lot 4, pt2.
9. When prompted for the *swing point*, select the end point of pt3.
10. When prompted to accept the results. enter **yes** and press <Enter>.
11. You have the desired results for Lot 3. However, Lot 4 is 955.74 m2 [10225.00 sqft] and Lot 5 is 1492.55m2 [16130.09 sqft]. You want to somewhat even-sized lots, each being approximately 1224 m2 [13,177.5 sqft]. Show the Parcel Layout Tools toolbar if it is not visible.
12. You should still be in the **Swing Line - Edit** command. (If not, repeat Steps 2-3 of this task.)

13. In the Parcel Layout Tools toolbar, click  to expand it. Change the minimum area to **1224** [13,177.5 sqft]. Collapse the toolbar if needed by clicking .
14. When prompted to select the parcel line to adjust, select the parcel line between Lot 4 and Lot 5 (Line 1).
15. When prompted for the parcel to adjust, select Lot 4.
16. When prompted for the *start frontage*, select the bottom right corner of Lot 4, pt1. When prompted for the *end of the frontage*, select the top right corner of lot 5, pt2.
17. When prompted for the *swing point*, select the end point of pt3, as shown in Figure 2–51.

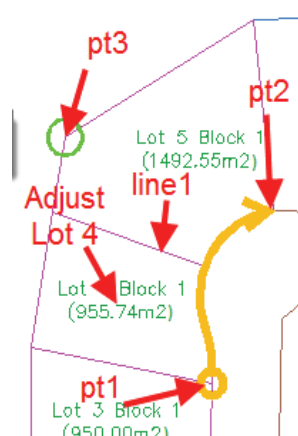


Figure 2–51

18. When prompted to accept the results, enter **yes** and press <Enter>.
19. Press <Esc> <Esc> or click the **X** in the Parcel Layout Tools dialog box to close it.
20. If time permits, perform the same steps as described above to subdivide Parcels Block 2 and Block 3.
21. Save the drawing.

Review Questions

Question 1 How do you create or subdivide parcels interactively?

Question 2 Which Parcel Create command enables you to hold a specified angle relative to the Right-Of-Way?

Section 3: Parcel Reports, Annotation, and Tables

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Reporting on and Annotating the Parcel Layout 2-47

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 Task 2: Create Line and Curve Segment Tables. 2-48

 Task 3: Create a Parcel Area Table. 2-50

 Task 4: Create a Parcel Report. 2-52

2.5 Parcel Reports

AutoCAD Civil 3D has several types of parcel reports. Parcel Inverse and Mapcheck data is available through the *Analysis* tab of the Parcel Properties dialog box, as shown in Figure 2–52. The report can be generated clockwise or counter-clockwise, and the point of beginning can be specified.

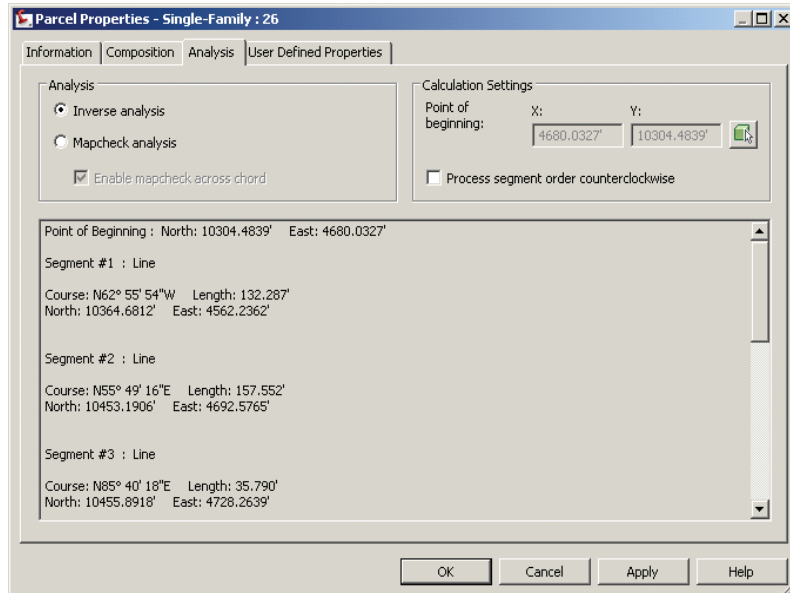


Figure 2–52

This dialog box does not enable output. If you want to generate a printable report, use AutoCAD Civil 3D Toolbox. It includes several stock Parcel-related reports (such as Surveyor Certificates, Inverse and Mapcheck reports, Metes and Bounds), as shown in Figure 2–53.

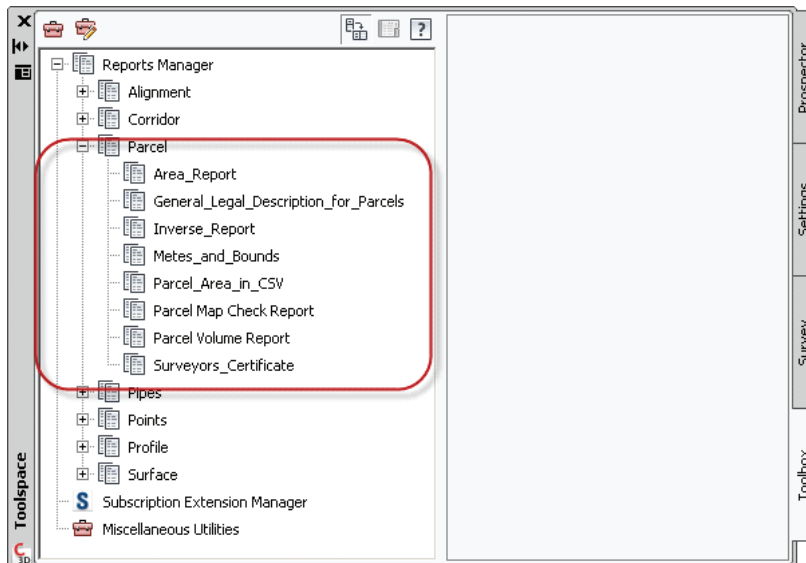


Figure 2–53

2.6 Parcel Labels

Parcel area labels are a means of graphically selecting a parcel, such as when creating Right-of-Ways. In the Parcel creation and editing examples, you had parcel segment labels created for you automatically. This section explores the functionality of these labels in more depth.

The Add Labels dialog box (**Annotate > Add Labels > Parcel > Add Parcel Labels...**) can be used to assign the desired label styles and place labels in the drawing. It can set the line, curve, and spiral styles and toggle between single and multiple segment labeling, as well as access the Tag Numbering Table. The dialog box is shown in Figure 2–54.

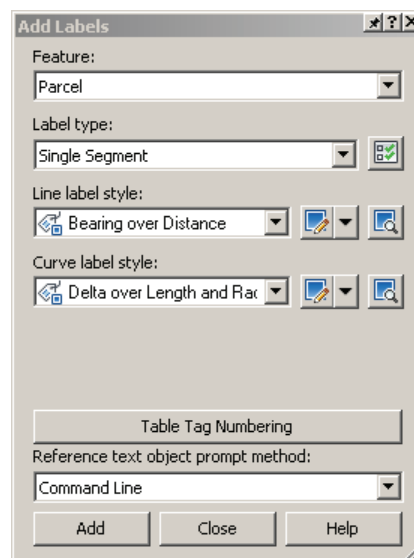


Figure 2–54

- Parcel labels, as with all AutoCAD Civil 3D labels, are capable of rotating and resizing to match changes in the viewport scale and rotation.
- A segment label has two definitions: composed and dragged state. A dragged state can be quite different from the original label definition.
- AutoCAD Civil 3D software can label segments while sizing parcels.
- Labeling can be read clockwise or counter-clockwise around the parcel.
- Labels can be added through an external reference file using the same commands that label objects in their source drawing. This makes it easier to have multiple plans that need different label styles.

- The **Replace Multiple Labels** option is useful when you want to replace a number of parcel segment labels with another style. However, if you are labeling through an external reference file, labels created in the source drawing cannot be modified.

Parcel Area labels are controlled using Parcel Area Label Styles, which control the display of custom information (such as the parcel number, area, perimeter, address, etc.). You can create more than one parcel area label, for example, if you need to show different parcel information on different sheets. An example is shown in Figure 2–55.

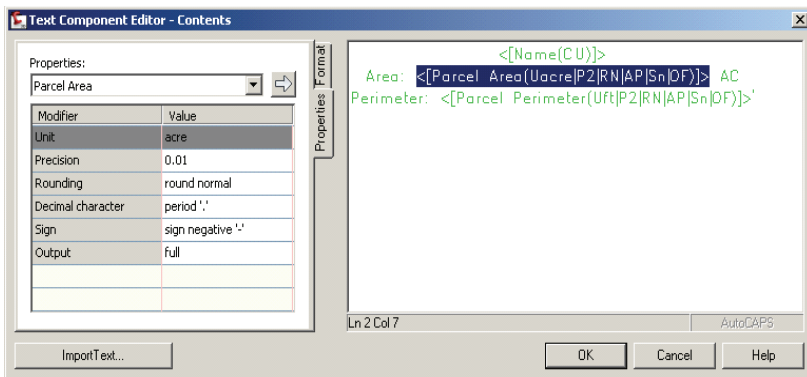


Figure 2–55

Parcel Segment labels annotate the line and curve segments of a parcel, as shown in Figure 2–56. You can label all segments of a parcel with one click or label only selected parcel segments.

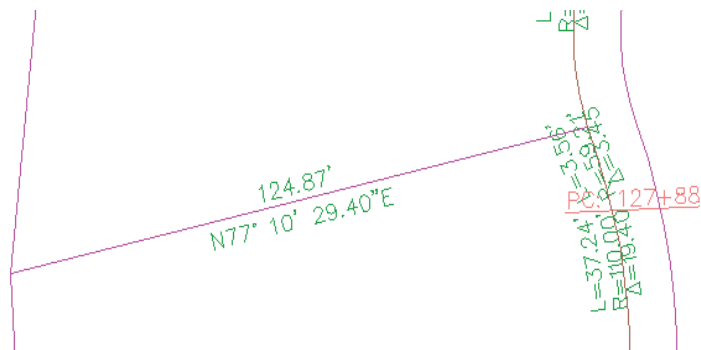


Figure 2–56

All labels have two definitions: one for the original location, and another when it is moved from its original location. A dragged label can remain as originally defined or can be changed to stacked text.

2.7 Parcel Tables

Parcel tables are an alternative to labeling individual parcel areas and segments. An example is shown in Figure 2–57.

Parcel Line and Curve Table			
Line #/Curve #	Length	Bearing/Delta	Radius
L76	112.01	N4° 08' 12.22"W	
L77	395.08	N85° 33' 05.19"E	
L78	471.49	N85° 33' 05.19"E	
L79	210.99	N4° 17' 33.13"W	
L80	211.55	N4° 17' 33.13"W	
L81	115.43	S25° 31' 05.98"W	

Figure 2–57

When creating a table, AutoCAD Civil 3D software changes the parcel segment labels to an alpha-numeric combination, called a *tag*. A tag with **L** stands for line and **C** stands for curve. A segment's tag has a corresponding entry in the table.

- A table can only represent a selected set of label styles.
- The **Add Existing** option, as shown in Figure 2–58, creates a table from existing objects. New objects will not be added to the table. The **Add Existing and New** option will create a table with existing as well as new objects.

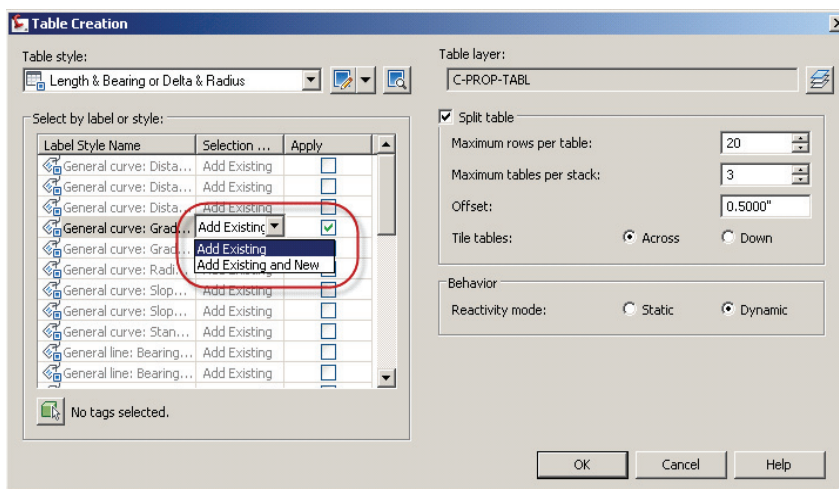


Figure 2–58

- A table can have a dynamic link between a segment's tag and table entry. If the segment changes, the table entry updates.
- AutoCAD Civil 3D switches a label to a tag by changing the *Display* mode from **Label** to **Tag**, as shown in Figure 2–59.

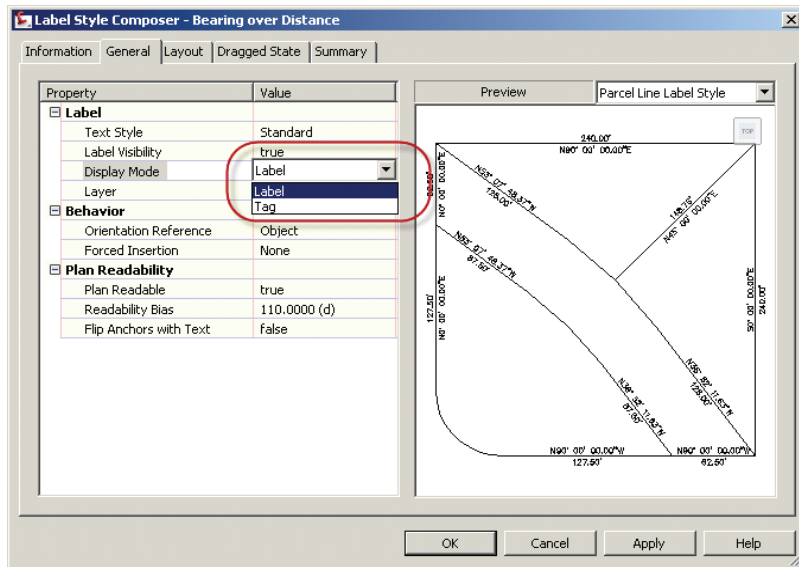


Figure 2–59

Practice 2c

Reporting on and Annotating the Parcel Layout

Task 1 - Add Parcel labels.

1. Continue working with the drawing from the previous practice or open the file **PCL1-C1-Parcels.dwg** from one of the following folders:

Metric:

C:\Civil 3D Projects\Civil3D-training-M\Drawings\Parcels

Imperial:

C:\Civil 3D Projects\Civil3D-training-I\Drawings\Parcels

2. In the *Annotate* tab > Labels & Tables panel, select **Add Labels**, as shown in Figure 2–60.

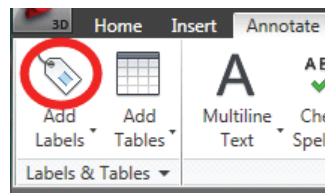


Figure 2–60

3. In the Add Labels dialog box, set the following parameters, as shown in Figure 2–61:
 - Feature: **Parcel**
 - Label type: **Multiple Segment**
 - Line label style: **Azimuth over Distance**
 - Curve label style: **Delta over Length and Radius**

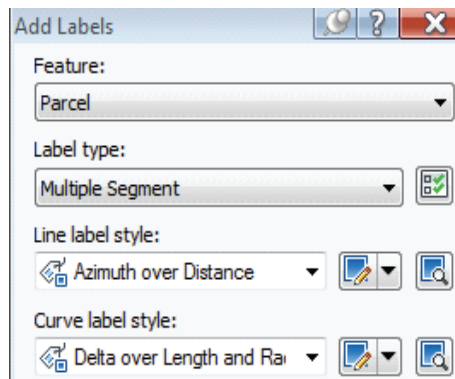

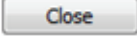


Figure 2–61

Parcels can also be labeled in an XREF file.

4. Click .
5. When prompted to select the Parcels you want to annotate, select the single-family parcel labels in Model Space.
6. When prompted for the label direction, enter **CL** for clockwise and press <Enter>.
7. Repeat the previous three steps for all remaining single-family parcels.
8. Press <Enter> when done labeling the parcels.
9. Click the **X** in the Add Labels dialog box or click  to close the dialog box.
10. Save the drawing.

Task 2 - Create Line and Curve Segment Tables.

Labels are overlapping in a number of locations, making the drawing difficult to read. In this task, you try two methods to fix this. In the first method, you simply drag the label to a location where there is no conflict. In the second method, you add a label tag and an associated table.

1. Continue working with the drawing from the previous task, or open the file **PCL1-C2-Parcels.dwg**.
2. In the *View* tab > Views panel, select the preset view **C3D-Parcel-Add Tag1**.

3. Select the label **3.64m [8.91ft]**, select the square grip, and drag to place the label in a location where there is no conflict. Do the same for the label **6.37m [24.21ft]**, as shown in Figure 2–62.

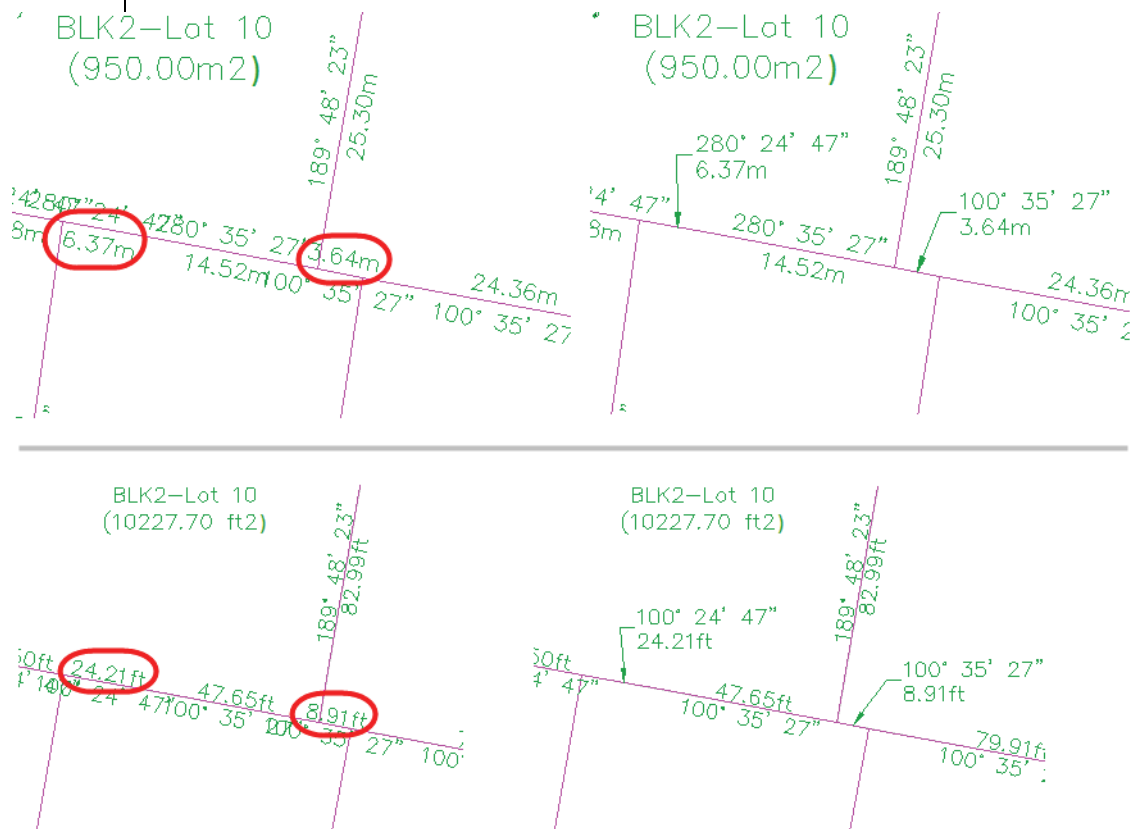


Figure 2–62

4. You will now add tags and a table. In the *Annotate* tab > Label & Tables panel, select **Add Tables > Parcel > Add segment**, as shown in Figure 2–63.

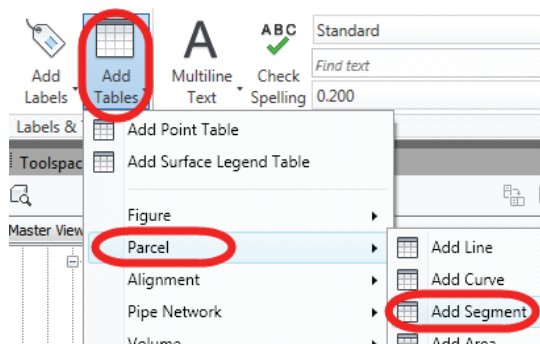



Figure 2–63

- In the Table Creation dialog box, click  (Select on screen) and select the labels shown in Figure 2–64. Press <Enter> when done.

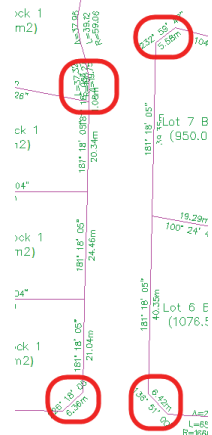
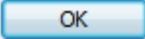


Figure 2–64

- When prompted to convert labels to tags or to not add labels, select **Convert all selected label styles to tag mode**.
- Click  to close the Table Creation dialog box.
- When prompted for a location for the table, select a location in an open space, as shown in Figure 2–65.

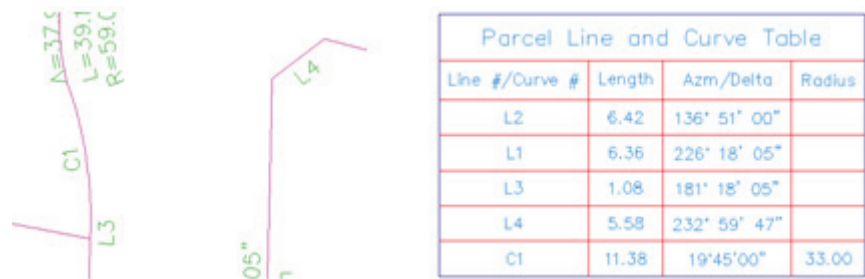


Figure 2–65

- Save the drawing.

Task 3 - Create a Parcel Area Table.

- Continue working with the drawing from the previous task, or open the file **PCL1-C3-Parcels.dwg**.
- In the *Annotate* tab > Label & Tables panel, select **Add Tables > Parcel > Add Area**.

- In the Table Creation dialog box, select the style name **Parcel Name - Area** in the *Select by label or style* section, as shown in Figure 2–66. All parcels with this style will be selected. Click **OK** to close the dialog box.

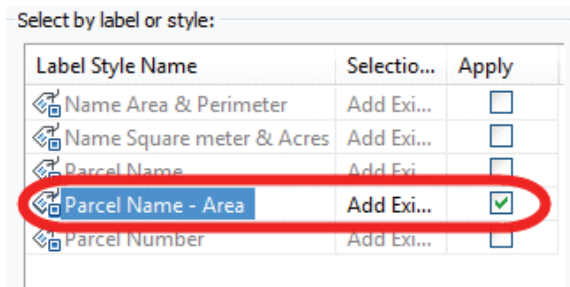


Figure 2–66

- Click a location to insert the table into the drawing, as shown in Figure 2–67.


Parcel Area Table				
Lot	Area	Perimeter	Segment Lengths	Segment Bearings
BLK1–Lot 1	950.00m ²	124.09	126.51 69.02 20.88 109.83 80.86	89° 58' 04" 181° 18' 05" 226° 18' 05" 271° 18' 05" 359° 58' 04"
BLK1–Lot 2	950.00m ²	126.61	128.38 80.26 126.51 80.24	89° 58' 04" 181° 18' 05" 269° 58' 04" 359° 58' 04"
BLK1–Lot 3	950.00m ²	127.67	132.28 66.72 128.38 91.50	100° 46' 26" 181° 18' 05" 269° 58' 04" 359° 58' 04"

Parcel Area Table				
Lot	Area	Perimeter	Segment Lengths	Segment Bearings
BLK1–Lot 1	10225.00ft ²	407.10	126.51 69.02 20.88 109.83 80.86	N89° 58' 04.39"E S1° 18' 04.79"W S46° 18' 04.79"W N88° 41' 55.21"W N0° 01' 55.61"W
BLK1–Lot 2	10225.00ft ²	415.37	128.38 80.25 126.51 80.23	N89° 58' 04.39"E S1° 18' 04.79"W S89° 58' 04.39"W N0° 01' 55.61"W
BLK1–Lot 3	10225.00ft ²	418.87	132.28 66.70 128.38 91.51	S79° 12' 46.38"E S1° 18' 04.79"W S89° 58' 04.39"W N0° 01' 55.61"W

Figure 2–67

- Save the drawing.

Task 4 - Create a Parcel Report.

1. Continue working with the drawing from the previous task, or open the file **PCL1-C4-Parcels.dwg**.
2. If the *Toolbox* tab is not visible, go to the *Home* tab > Palettes panel, and click  (Toolbox), as shown in Figure 2–68.

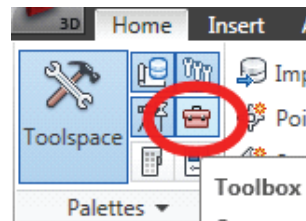

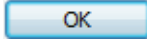
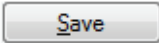


Figure 2–68

3. In the *Toolbox* tab, expand the Reports Manager and Parcel collections. Right-click on Surveyor's Certificate and select **Execute**.
4. In the Export to LandXML dialog box, click  (Pick from drawing), located at the bottom left of the dialog box.
5. When prompted to select a parcel, select one of the single-family lots created earlier and press <Enter>.
6. In the Export to XML Report dialog box, notice that only the Lots you selected now have a check mark. Click  to close the dialog box.
7. In the Save As dialog box, enter the desired file name for the report and click  to close.

8. Review the report, as shown in Figure 2–69, and close the web browser,

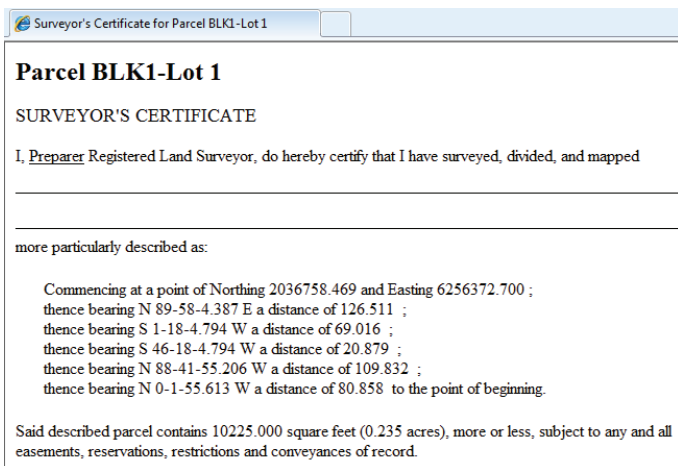
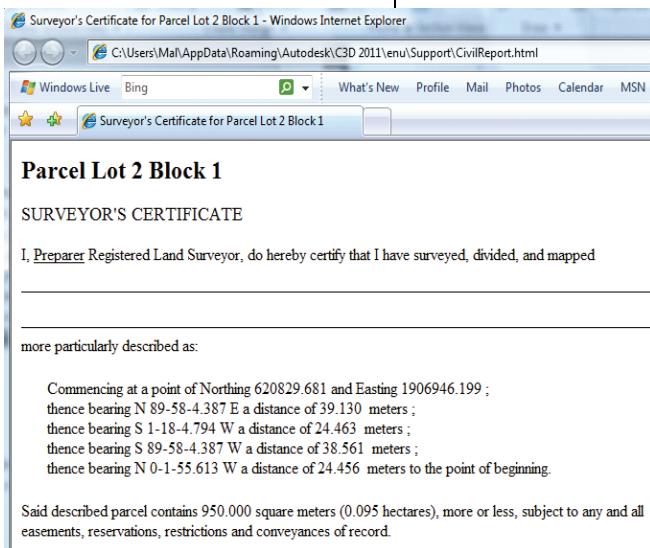


Figure 2–69

9. Save the drawing.

Either of these formats can be opened in word processors such as Microsoft Word, which can read all of the formatting displayed in the web browser. Report settings, such as the Preparer's name, can be assigned by clicking **Report Settings** in the Toolspace.

Review Questions

- Question 1** What are the two types of AutoCAD Civil 3D Parcel labels?
- Question 2** What does the Add Labels dialog box do?
- Question 3** What are parcel tables an alternative to?