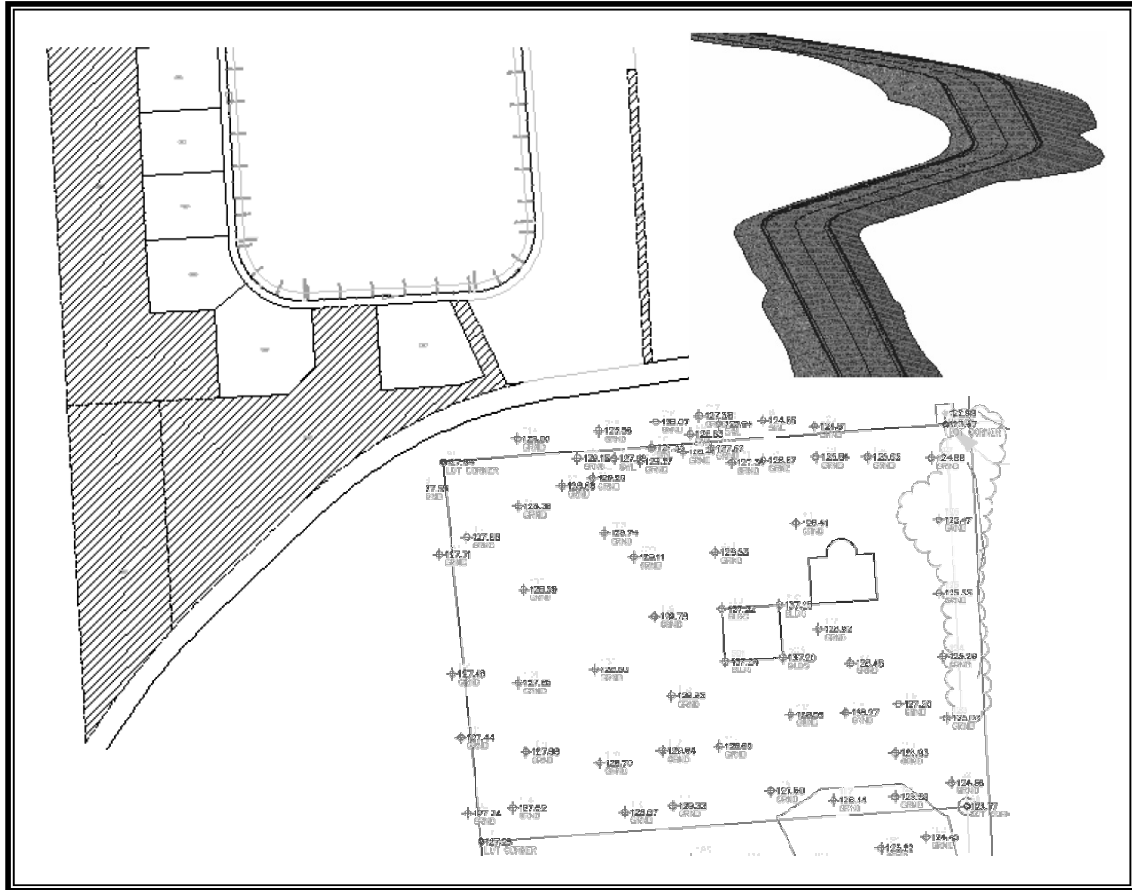


# AutoCAD Civil 3D 2008 ESSENTIALS



**SDC**  
PUBLICATIONS

Schroff Development Corporation

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## **Section 2: Subdividing Parcels**

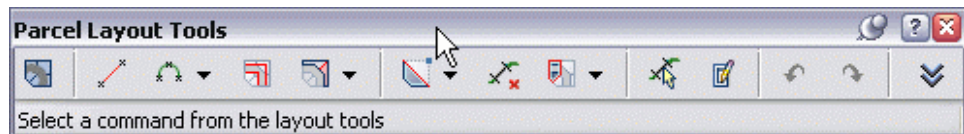
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In this section you will learn how to:

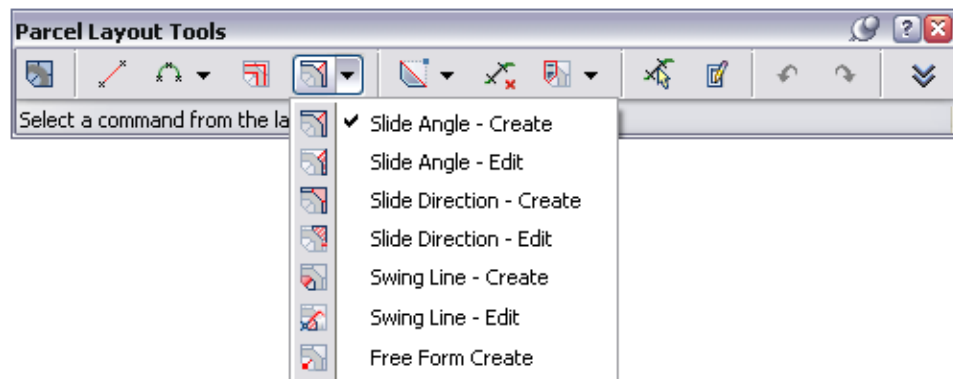
- Define parcels using layout tools.
- Edit parcels using layout tools.

## Creating and Editing Parcels by Layout Overview

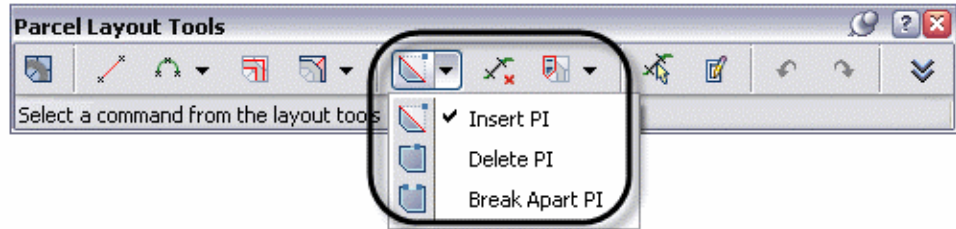
In addition to creating parcels from polylines, arcs, and lines, AutoCAD Civil 3D can also intelligently create (and adjust) parcels using tools in the Parcel Layout toolbar. To open the Parcel Layout toolbar select **Parcels>Create Parcels by Layout**.



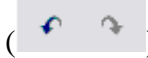



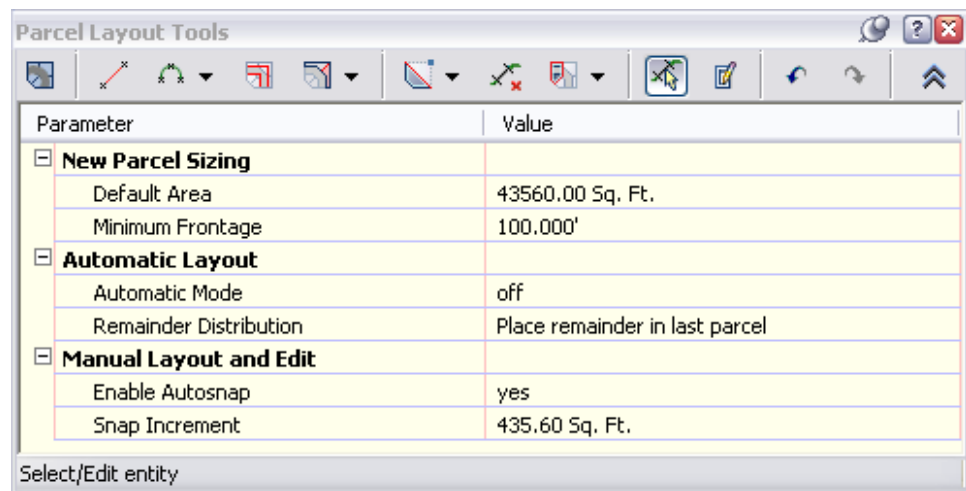
-  (Create Parcel) assigns parcel creation settings such as parcel type, labeling styles, and other parameters.
- The **Line** and **Curve** commands (  ) can be used create individual line and curve parcel segments. Segments created with these tools are considered *fixed* (see the Alignment section 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 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 free-hand drawing of a parcel boundary. The most frequently used methods are **Slide Angle** and **Slide Direction**.



- The buttons in the center of the toolbar 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.



-  (Pick Sub-Entity) enables you to select a parcel line and look at its details in the Parcel Layout Parameters dialog box.
-  (Sub-entity Editor) opens and closes the Parcel Layout Parameters dialog box.
- The next two buttons enable you to **Undo** and **Redo** parcel edits ().
- The drop-down arrow () expands the toolbar to show the Parcel Creation Parameters (also accessible through the Command Settings of CreateParcelByLayout in the *Settings* tab).

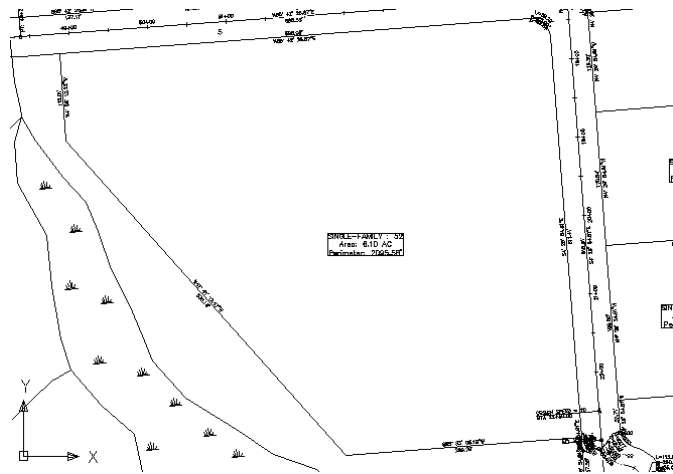


- The *New Parcel Sizing* section sets the minimum area for parcels to be laid out, while the Minimum Frontage value sets the minimum width of a parcel at the ROW. (Frontage can only be measured at the ROW with AutoCAD Civil 3D – not at a setback from the ROW.)

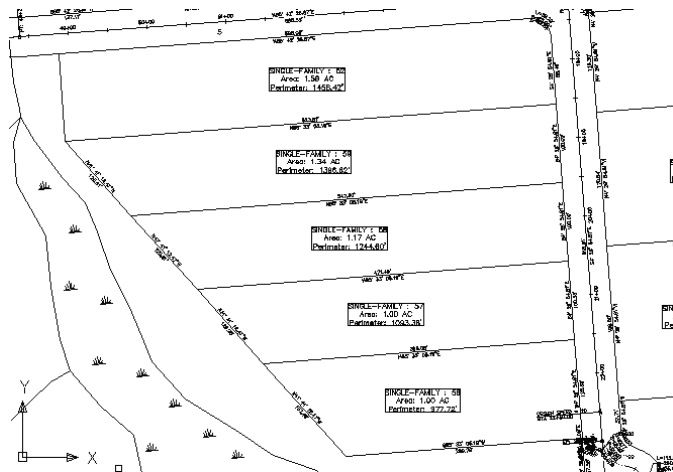
- The *Automatic Layout* section affects how parcel auto-sizing subdivides a parcel block.
- The *Manual Layout and Edit* settings toggle on parcel sizing snaps. The *Snap Increment* setting is an amount of area by which you increase or decrease lot sizes when adjusting manually. This setting controls the amount of area a parcel can expand or contract to while you are sizing (creating and editing) a parcel.

## Creating and Editing Parcel Techniques

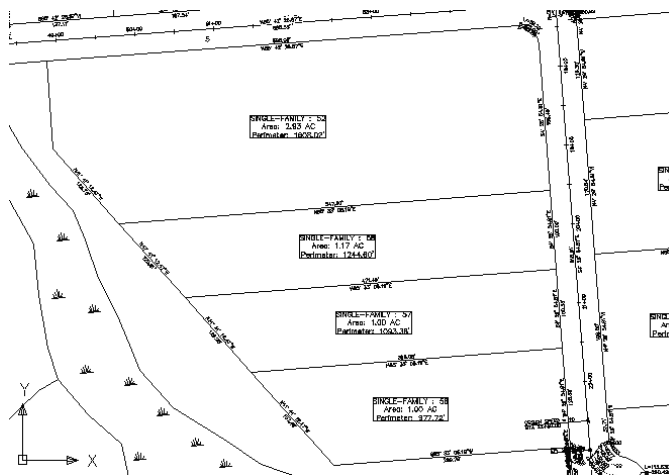
The create parcels by layout tools can quickly help you create a subdivision plan. Although these tools can make your job easier and are faster than manual drafting, they are only effective in creating the fourth side of new parcels. In other words, you might need to create additional (or adjust) parcel lines manually to guide AutoCAD Civil 3D to the best solution. Take this 6-acre area for example, in which you need to create 6x 1-acre parcels:



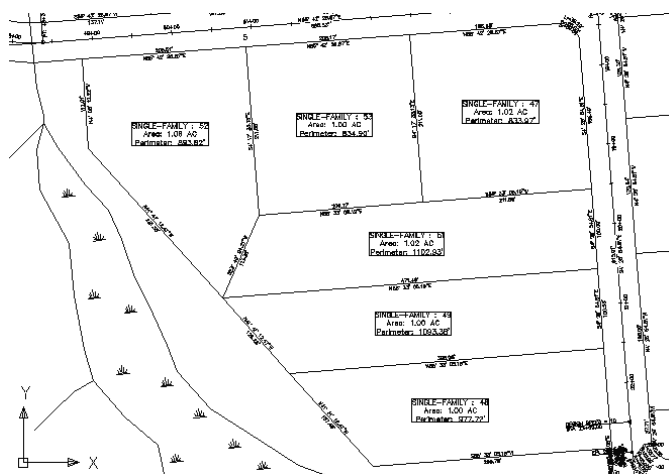
The back parcel lines (the ones along the west and south of the area) were drawn manually to guide the creation of the rest. If you ask AutoCAD Civil 3D to automatically subdivide this area the result is five parcels.



If you merge together the top two parcels ...





...you can then subdivide the combined area again and adjust it as needed.

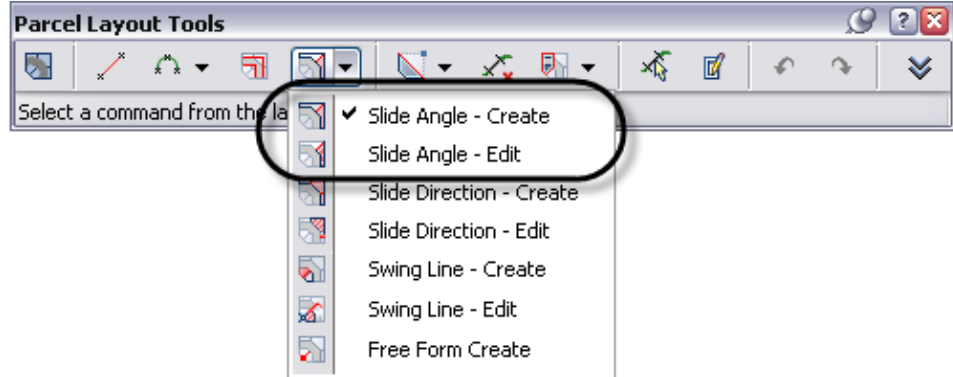


Below is a brief explanation of the various creation and editing techniques available through the Create Parcel by Layout toolbar.

### Freehand

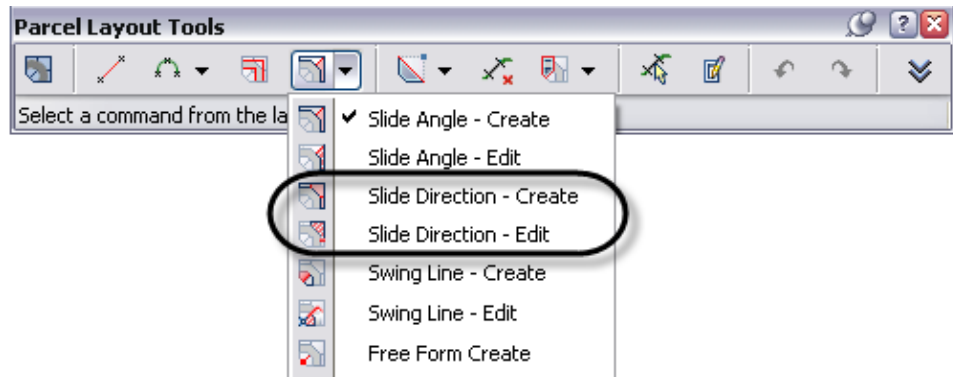
The **Line** and **Curve** commands (  ) and  (Draw Tangent – Tangent with No Curves) enable you to create lot lines without having to specify an area. In contrast, the tools below all create parcels based on a specified area.

## Slide Angle



The **Slide Angle – Create** 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°. The **Slide Angle – Edit** command enables you to modify a parcel to a specified area while holding the same angle from the ROW.

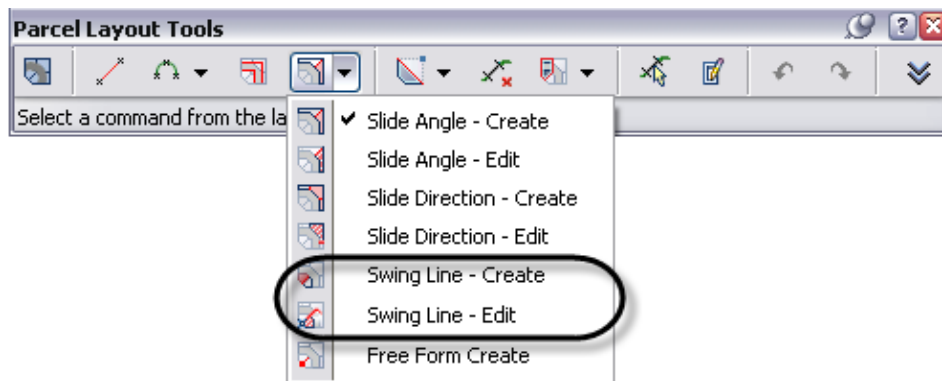
## Slide Direction



The **Slide Direction – Create** command enables you to subdivide by creating new parcel lines that hold a specified, absolute angle. The **Slide Direction – Edit** command enables you to modify a parcel to have a certain area while holding an absolute angle. This angle can be determined by an azimuth, a bearing, or by selecting two points in the drawing.



## 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.

## Free Form Create

The **Free Form Create** command in the parcel sizing flyout 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 to trace its frontage geometry. This is a critical step. As you trace the frontage, the command creates a jig (heavy highlight) recognizing the changing geometry of the frontage line work.



## Practice - Create and Edit Parcels

The Woodberry property encompasses 56.3 acres, of which you need to preserve 40% as contiguous open space. The local municipality requires 1 acre (43,560 ft<sup>2</sup>) lots with 100 ft of frontage. You will attempt to leave the large, central wetland area and the area to the west and south of it as your open space.

### Task 1 - Create Parcels by Slide Angle

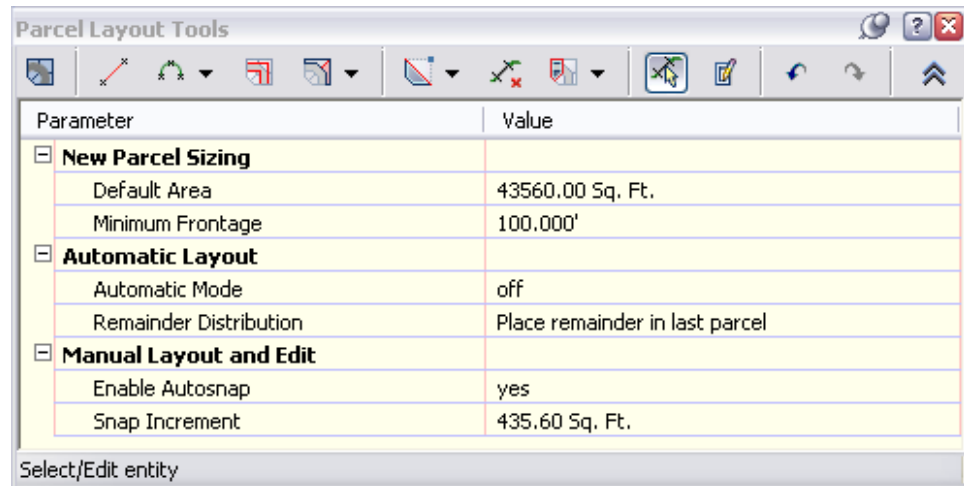
1. Continue working with the drawing from the previous Module or open **Site Design - Mod 4.2.1.dwg** from the following folder:

*C:\Civil 3D Projects\Civil 3D 2008 Essentials Class Files\Backup*

If used, after opening this file save it as **Site Design.dwg** in folder listed below. Overwrite a previous drawing of the same name as needed.

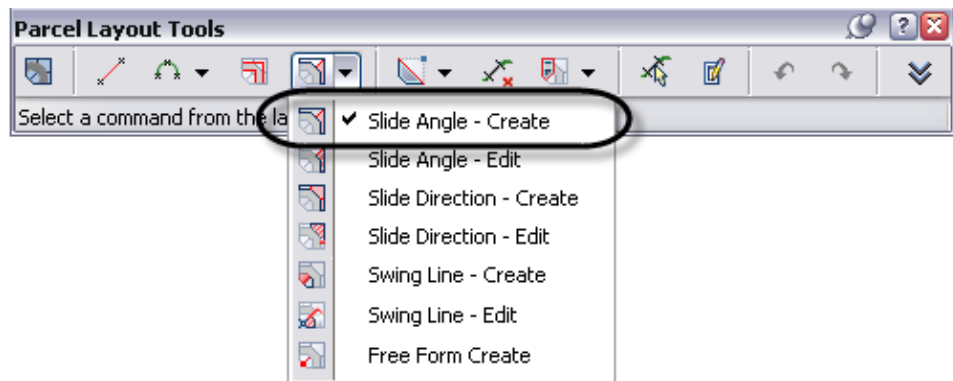
*C:\Civil 3D Projects\Civil 3D 2008 Essentials Class Files*

2. Select **Parcels>Create by Layout**. In the Parcel Layout toolbar click the arrow button to reveal the parcel layout parameters. Confirm the settings shown below.

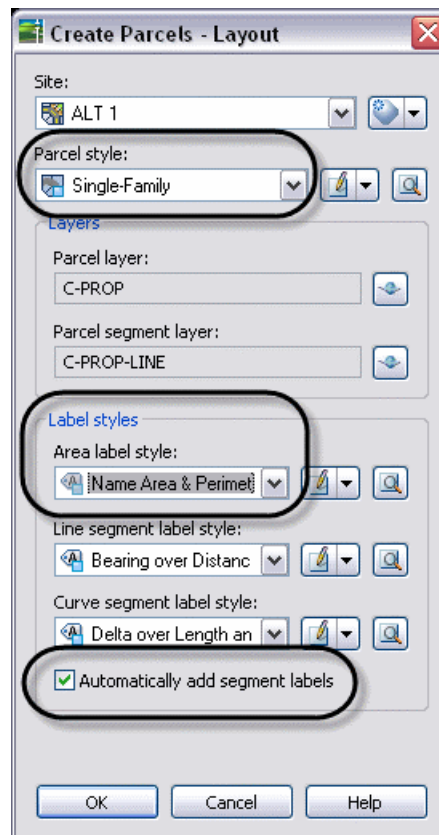


3. Click the toolbar's arrow button again to hide these options.
4. Zoom and pan to the northwest corner of the property.

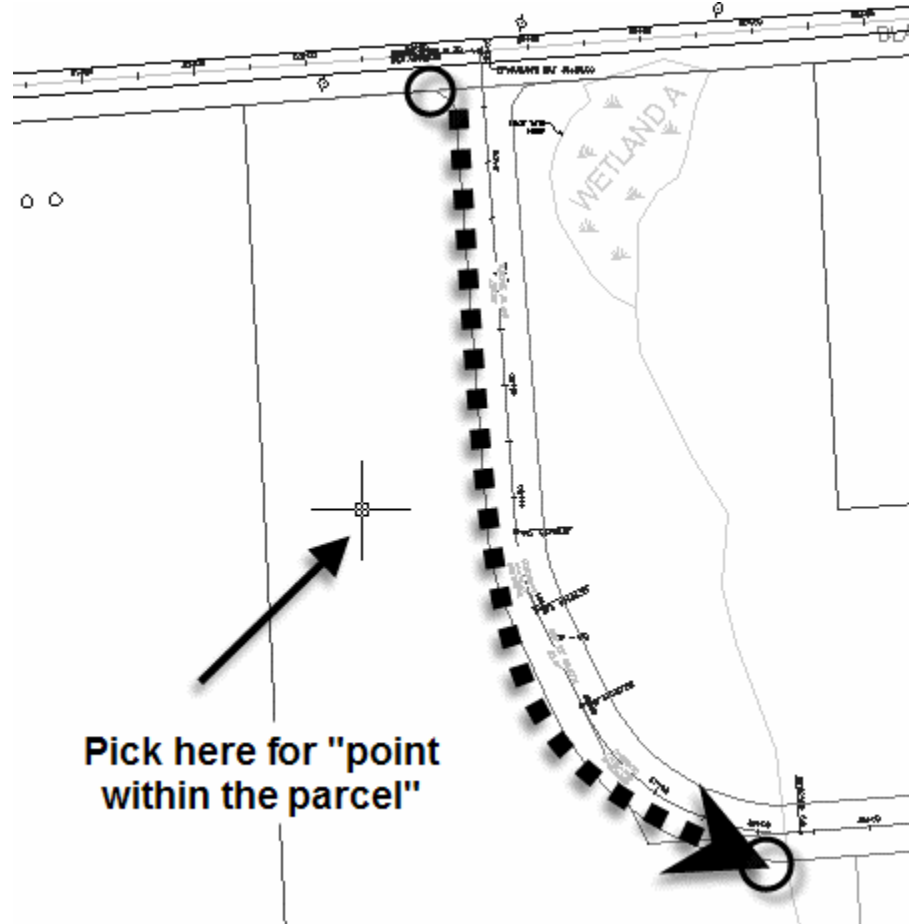
- In the Parcel Layout toolbar select **Slide Angle – Create**.



- In the Create Parcels – Layout Settings dialog box enter the following options.

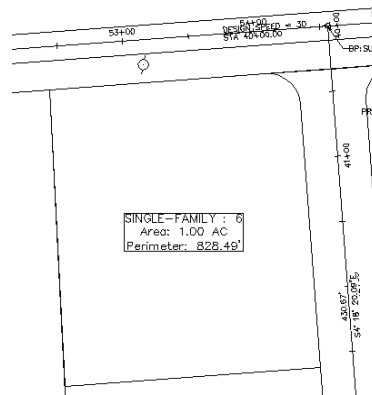


7. When prompted to pick a point in the parcel to be subdivided click within the **Property: 2** parcel as shown below. If you have trouble picking a point inside the parcel, temporarily turn off running OSNAPs.



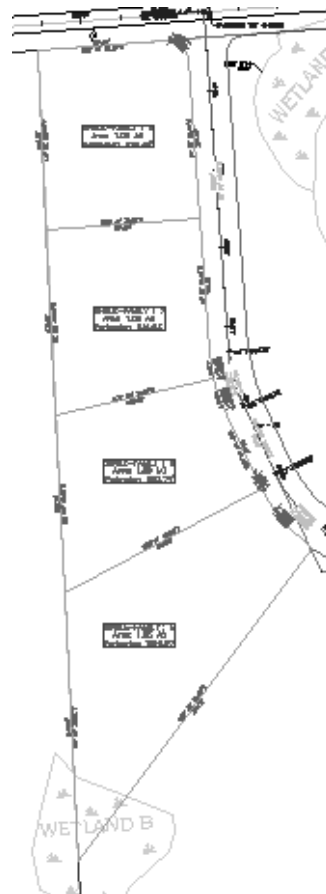
8. When prompted for frontage, start by snapping to the endpoint of the ROW parcel shown in the uppermost circle above. Then move your cursor over the ROW to the endpoint of the curve with the lower circle, and snap to the endpoint of the arc in that area. As you move your mouse the ROW parcel should be temporarily given a very thick highlighting, called a jig.
9. You are then prompted for the angle to be held along the ROW. Press <Enter> to accept the default value of 90°. (This angle is not listed as the default in the Command Line.)

- You are then prompted for the parcel area. Press <Enter> to accept the default of 43,450ft<sup>2</sup>. A parcel should then be created.



- AutoCAD Civil 3D prompts you again for the angle measured at the frontage and area. Accept the defaults for both and a second parcel is created.

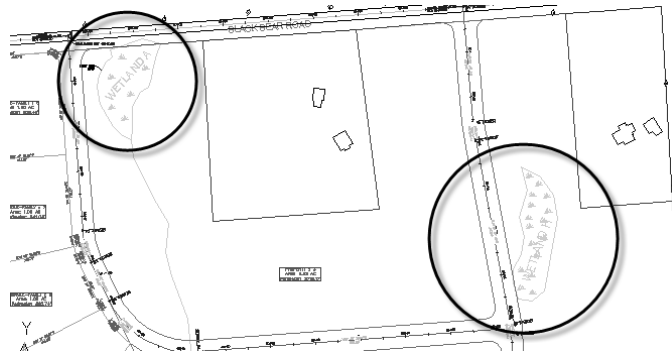
- Create a total of four parcels in this manner, and press <Esc> twice to cancel the command.



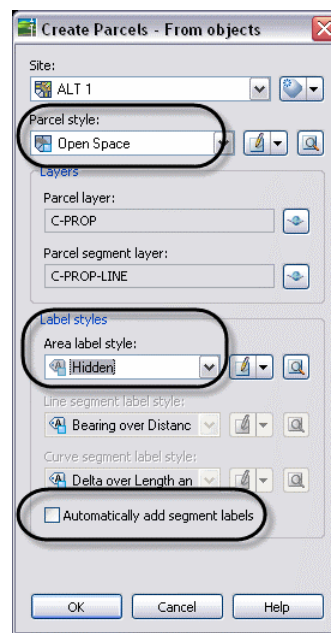
## Task 2 - Create Temporary Parcels for Wetlands A and H

*In the finished state you expect wetland C and B to be part of an Open Area parcel. Wetlands A and H, though, might be inside of build-able lots. Since the local municipality does not permit you to include wetland area as part of the 1 acre minimum, you will temporarily create open area parcels for A and H. Later you will delete these wetland parcels and enable their area to be incorporated into adjacent lots.*

1. Select **Parcel>Create Parcel from Objects**. Enter **X** in the Command Line and press <Enter> to indicate that you are going to select a polyline from an XREF.
2. When prompted, select the wetland polylines shown circled below.



3. In the Create Parcels – From Objects dialog box select the options shown below.

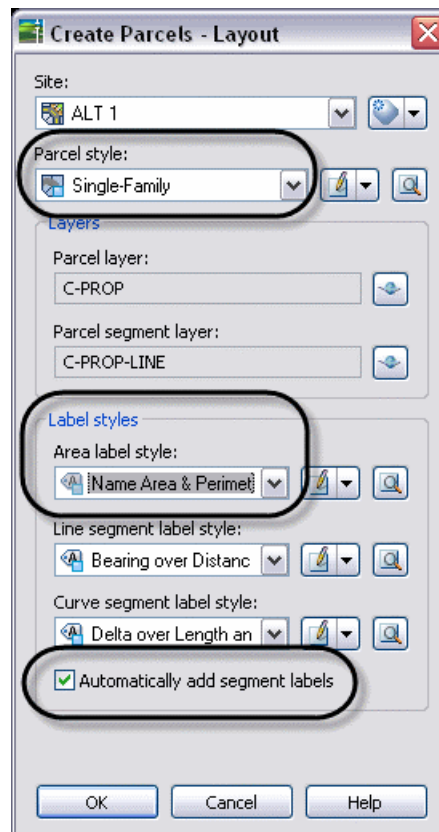


4. The two wetland areas should now be enclosed in green parcel segments.

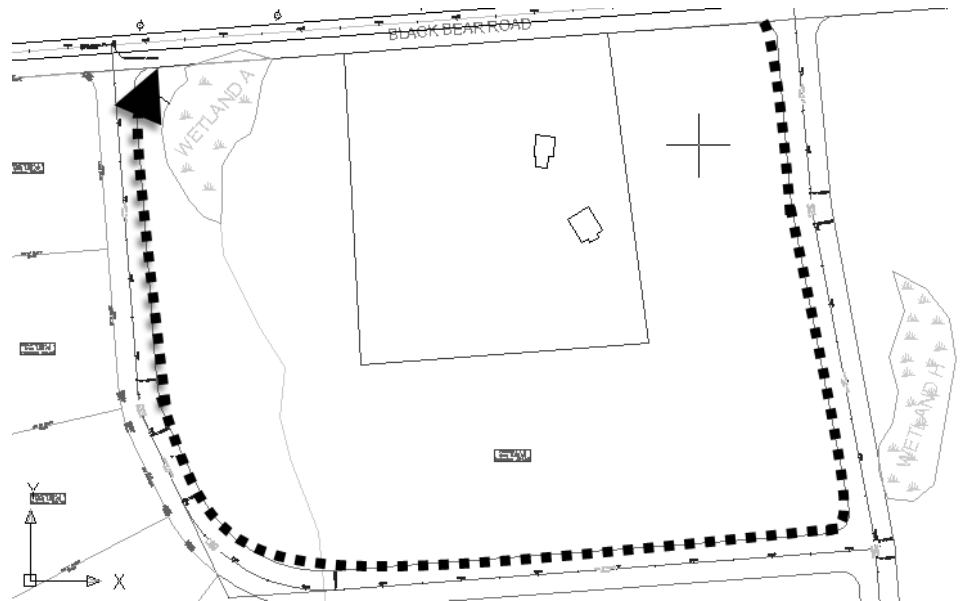
### Task 3 - Create Parcels by Slide Angle and Swing Line

*In this next step you will use the slide angle and swing line techniques to subdivide parcel **Property: 3**.*

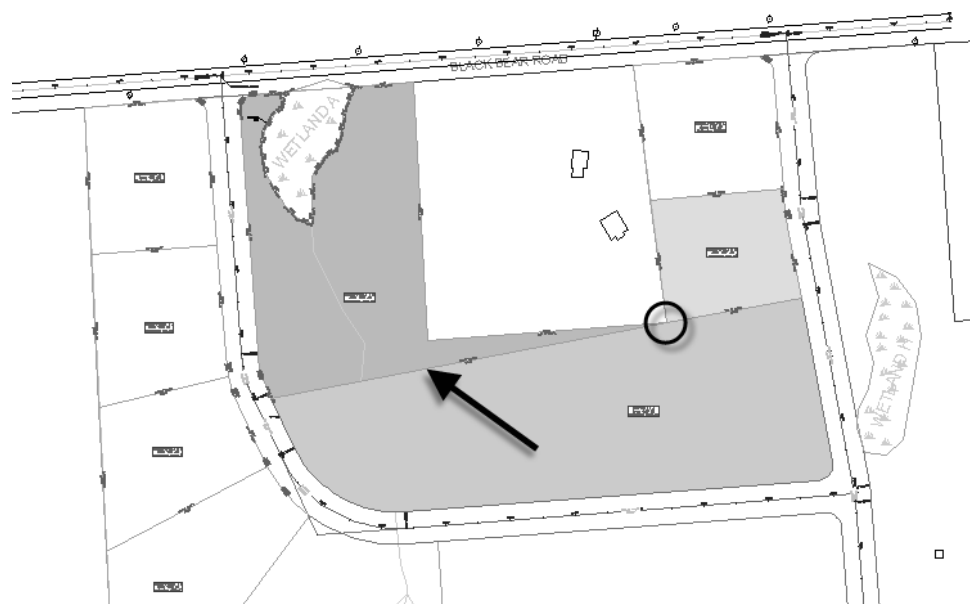
1. In the Prospector, locate **Property: 3** under the ALT 1 site. Right-click on it and select **Zoom To**.
2. You will start subdividing **Property: 3** in the northeast corner. In the Parcel Layout toolbar select **Slide Angle – Create**.
3. The Create Parcels dialog box shows the same options used the last time you created parcels by layout. (These settings are separate from those in the Create Parcels - From Objects dialog box). Verify the settings and click **OK**.



- When prompted pick a point within **Property: 3** and track frontage as shown with the dotted arrow below. Be sure to use the **endpoint** OSNAPs at both ends for accuracy.

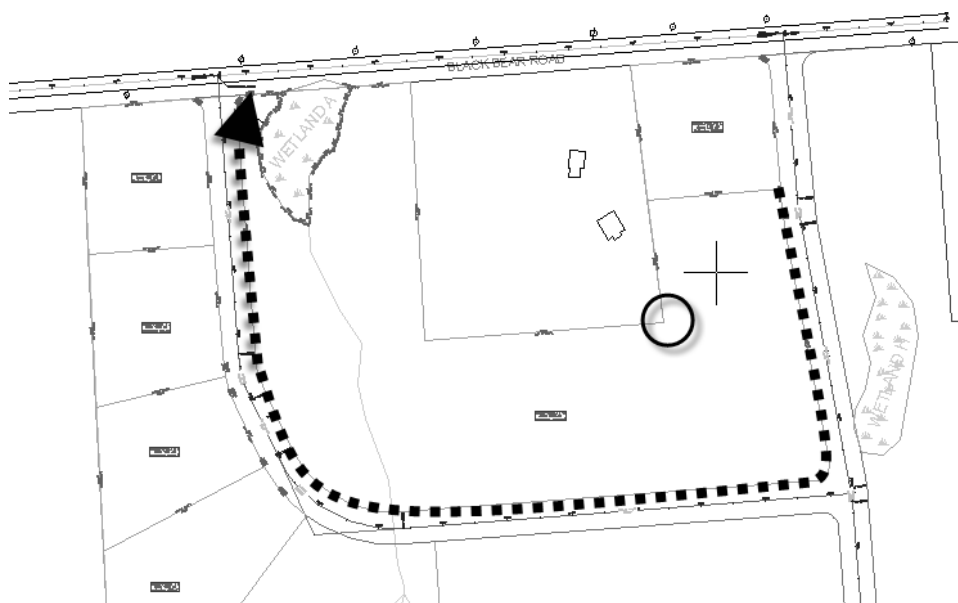


- Press <Enter> to accept the defaults for the angle at frontage and area.
- The first parcel is created as expected. However, the second parcel continued across the property to form three massive parcels. These are not acceptable. (They are shown with solid fills for clarity).





7. Delete the parcel line indicated by the arrow above. The three parcels join into one larger parcel again. Instead you will create a new parcel by swinging a line through the property corner shown circled above.
8. In the Parcel Layout toolbar select **Swing Line – Create**.
9. The Create Parcels – Layout dialog box options should match those shown in step 3. Click **OK**.
10. Pick the large, U-shaped parcel and track frontage as shown below with the dotted arrow. Be sure to use the **endpoint** OSNAP at the beginning and end of the frontage.



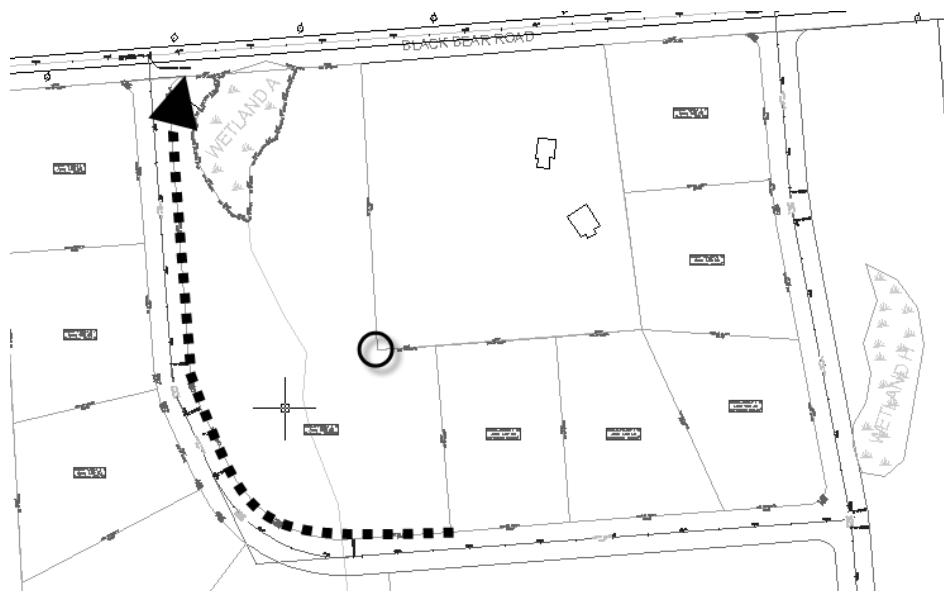
11. When asked for the Swing Point, use the **endpoint** OSNAP to snap to the property corner shown circled above.
12. When prompted for area press <Enter> to accept the default and a new parcel is created.

13. You will create a third parcel by swinging a line through the same swing point. When prompted for a swing point, pick the same point (shown circled above) and accept the default area. The area should now resemble the illustration shown below.



14. You will now add the next two parcels by sliding angles. In the Parcel Layout toolbar select **Slide Angle – Create**.
15. Accept the defaults in the Create Parcel – Layout Settings dialog box, and select a point within the now L-shaped parcel. Since you can only get so far with this method, you do not need to trace frontage to the far northwest corner of the site. The arrow shown above is sufficient.

16. Accept the defaults for angle at frontage and area prompts to create the two additional parcels shown below.




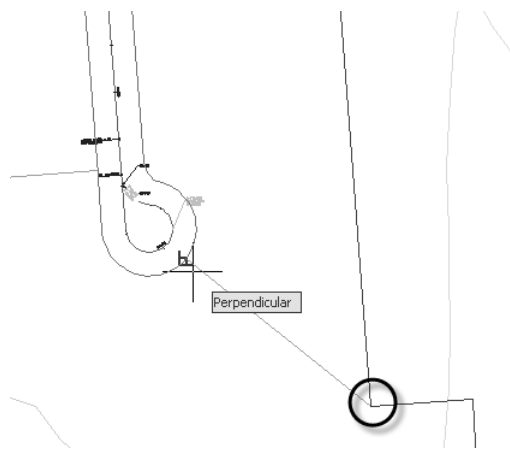
17. Create two more parcels with **Swing Line – Create** in the remaining area, with the frontage shown and the swing point circled above.
18. The last remaining parcel, minus the wetland area, is 1.83 acres – not enough for two parcels, so you will leave this one unchanged.
19. Delete the wetland area “A” parcel boundary, enabling it to be included in parcel **Single Family: 16** (now 2.22 acres).
20. Save the drawing.



#### Task 4 - Subdivide with a Fixed Parcel Line

*There are times where you might just want to add a parcel line in a particular place and not necessarily base the position on the area of one lot.*

1. Pan and zoom to the southeast corner of the site, near the cul-de-sac.
2. In the Parcel Layout toolbar click  (Add Fixed Line – Two Points).
3. Accept the defaults in the Create Parcels – Layout Settings dialog box, and draw this parcel line from the property corner shown circled below to a point perpendicular to the cul-de-sac ROW.

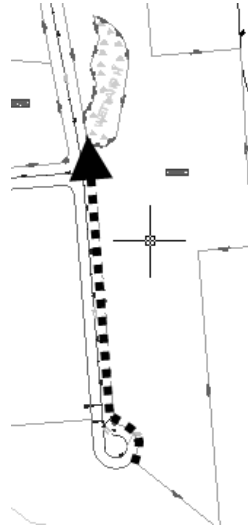


4. Press <Esc> twice to end the command and see the parcel area and segment labels appear.

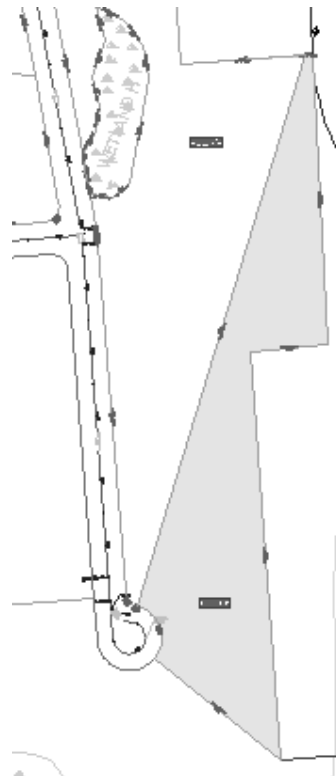
#### Task 5 - Editing parcels through Grip edits and Slide Angle – Adjust

1. Create some parcels moving north from this new parcel line. In the Parcel Layout toolbar select **Slide Angle – Create**.

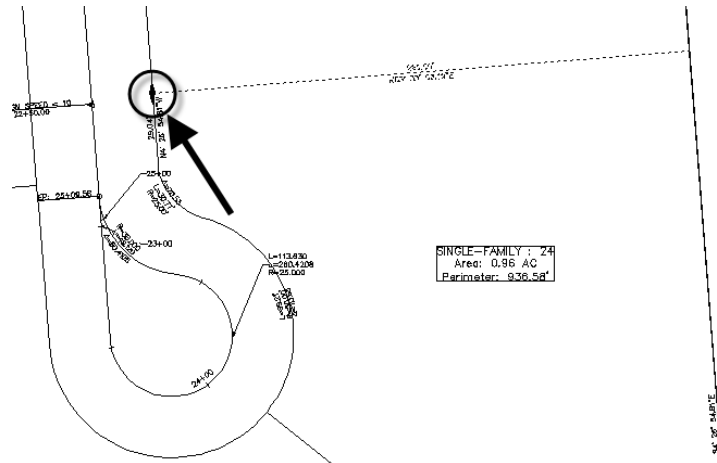
2. Accept the defaults in the Create Parcels – Layout Settings dialog box. When prompted measure frontage from the end of the fixed line just drawn, northward to the wetland area. You stop there because the frontage jig begins to track along the wetland area – which is not correct.



3. Create one parcel with the default angle and frontage. While trying to hold the 100' frontage, AutoCAD Civil 3D created a parcel that is not correct (shown with a solid fill below for clarity).



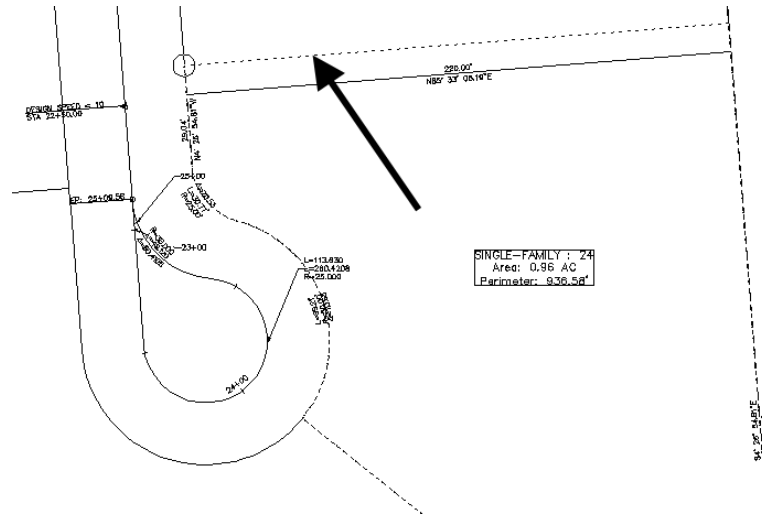
4. Instead of deleting it, click on the parcel line you just created to highlight it. The diamond grip at the ROW causes the line to hold the same angle as it moves. Manually slide the parcel line north so that the parcel is about **0.95 acres** in area.



5. To make the parcel exactly 1.00 acre, select **Slide Angle – Edit** in the Parcel Layout toolbar.
6. When prompted to select a lot line to adjust, pick the one you just manually grip-edited.
7. When prompted to specify an angle, press <Enter> to accept the default of 90°. Pick inside the parcel shown above to adjust it.
8. When prompted for an area enter **43560** in the Command Line.
9. You are prompted for a region to search for a solution. AutoCAD Civil 3D needs you to guide it by left-clicking somewhere on the screen. If your cursor is floating over a point that does not accommodate the desired area you see the red warning glyph below at your crosshairs:



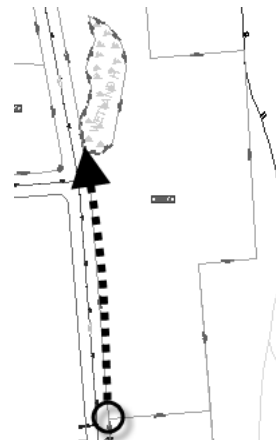
- To finish the command float your crosshairs to the north of the parcel until the dashed parcel line below becomes visible. Left-click to adjust the parcel.



- The command then prompts you for another lot line to adjust. If the parcel area label now indicates 1.00 acre, press <Esc> to finish the command. If the area is not listed as 1.00, repeat the process from step 6.

**Task 6 - Use Free Form Create and Slide Direction – Edit**

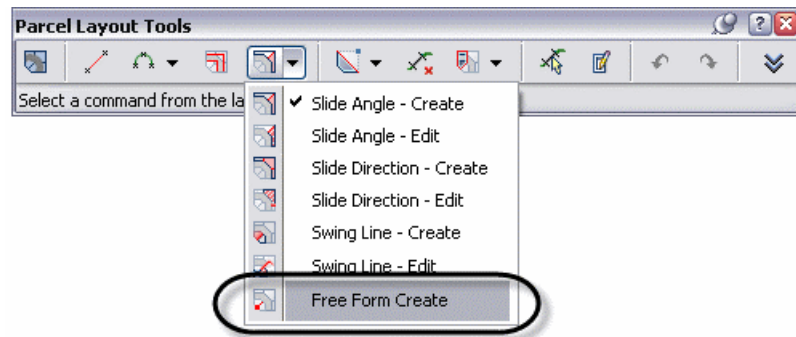
- Subdivide the area north of the parcel segment you just drew with **Slide Angle - Create**. Accept the default Create Parcel – Layout settings.
- When prompted pick a point in the parcel shown below, start measuring frontage at the point circled, and end frontage just south of the wetland area.



3. Accept the defaults for angle and area to create the three parcels shown below.



*The **Slide Angle – Create** command will not help you define the next lot since the wetland “parcel” is getting in the way. Instead click **Free Form Create** in the Parcel Layout toolbar. This is similar to creating a fixed line, except that the resulting parcel segment will hold its initial bearing as a constraint.*



4. Accept the default Create Parcel – Layout settings.



- As you move your mouse, a dynamic parcel segment appears under your crosshairs. Left-click to select an attachment point with the circle aligned to the back parcel line, in the approximate position shown below.

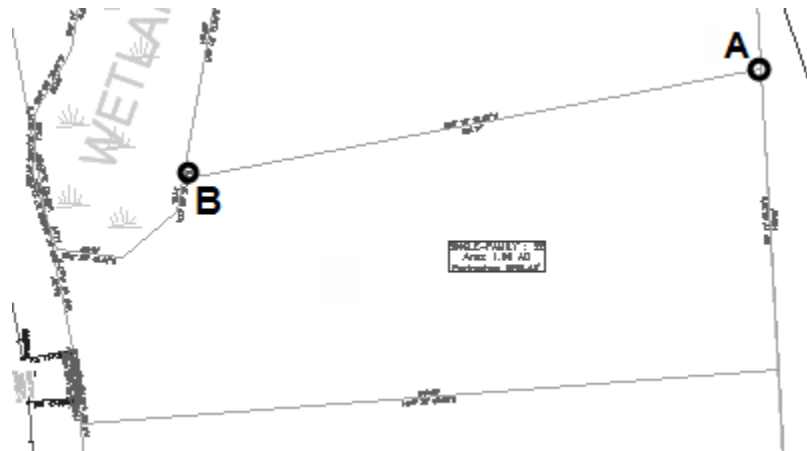


- When prompted for a lot line direction, start the **perpendicular** OSNAP (by typing **perp** in the Command Line), and pick a point perpendicular to the Benjamin Road alignment in the area indicated with the arrow above.

*Unless you were very lucky with that pick, the lot you just created is not 1.00 acre. Highlight the new lot line and note that the only grip is a diamond at the back lot line. This means the line can be used to slide along the back lot line and maintain the same angle. By having this constraint you can use the following edit to size the parcel to 1.00 acre.*

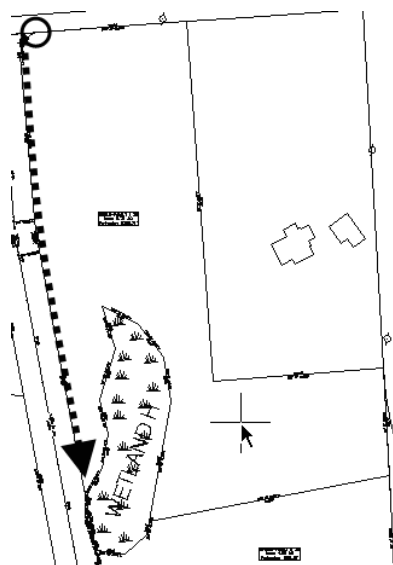
- In the Parcel Layout toolbar click **Slide Direction – Edit**. Accept the default Create Parcel – Layout settings.

8. You are prompted for a direction at start point. Instead of entering a value, snap to the endpoint at A, and then snap to the endpoint at B to define the angle. This angle enables you to stay perpendicular to the alignment as long as the segment is not adjusted too far from its current position.

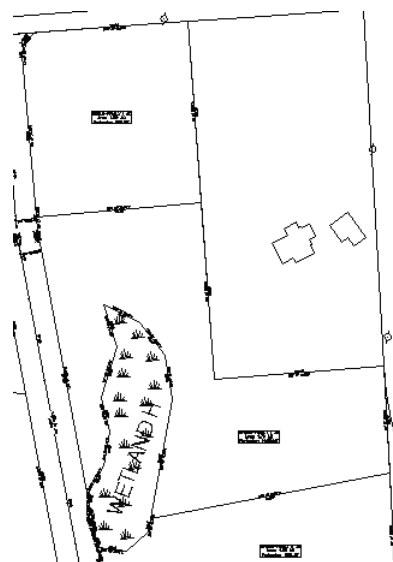


9. Click within the parcel shown above when prompted, then enter an area of **43560**.
10. If your parcel is currently above 1 acre, move your cursor south of the existing lot line until you see a valid solution and left click. If your parcel is below one acre, move it to the north of the existing lot line, and left-click when a solution is presented.
11. Press <Esc> to cancel the edit. The parcel should now be exactly 1.00 acre.
12. To complete this section of the design, select **Slide Angle – Create** and accept the default options. Pick a point north of the parcel you just created.

- When prompted, measure frontage from the circle shown below, southward toward the wetland area.



- Press <Enter> to accept the defaults for angle and area and create one more parcel as shown below.

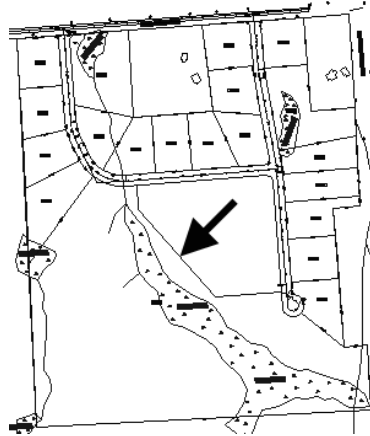


*You will leave the L-shaped lot near the wetland area unchanged, because it might be buildable, with a long driveway around the wetland.*

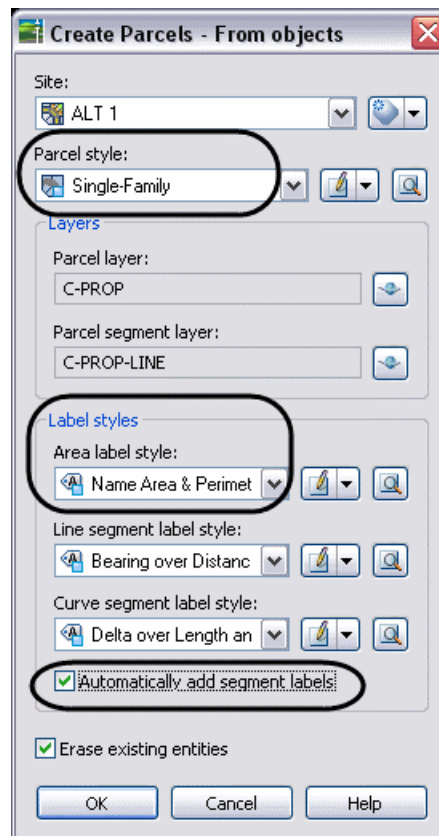
- Delete the wetland parcel to enable it to merge with the L-shaped lot.
- Save your drawing.

### Task 7 - Automatic Parcel Creation Mode (Optional)

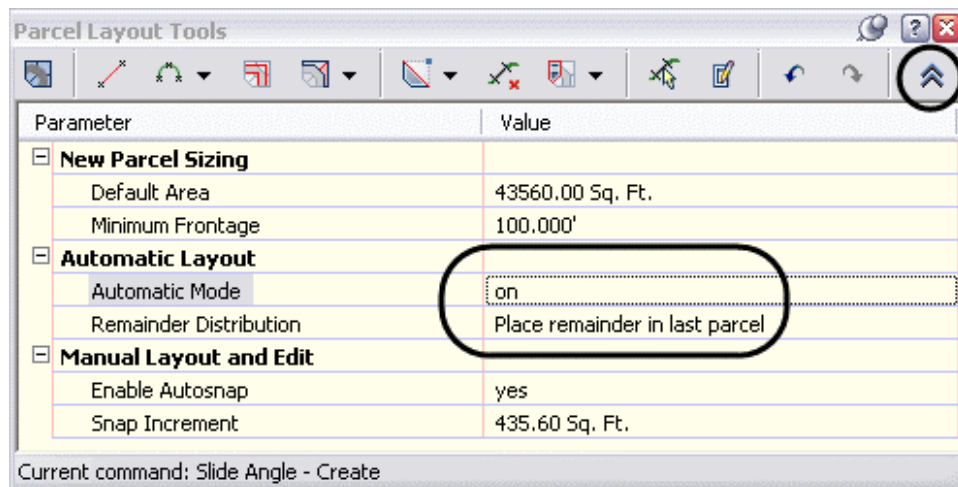
1. Convert the magenta polyline indicated below to parcel segments with **Parcels>Create from Objects**.



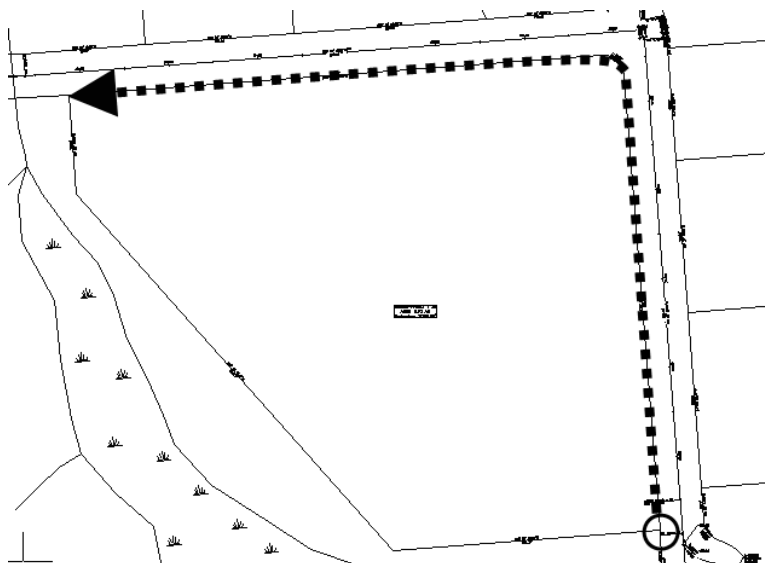
2. In the Create Parcels – From Objects dialog box assign the following settings:



- In the Parcel Layout toolbar, click the down arrow to show the sizing parameters. Set *automatic mode* to **On** and leave the remaining distribution option as **Place remainder in last parcel**.

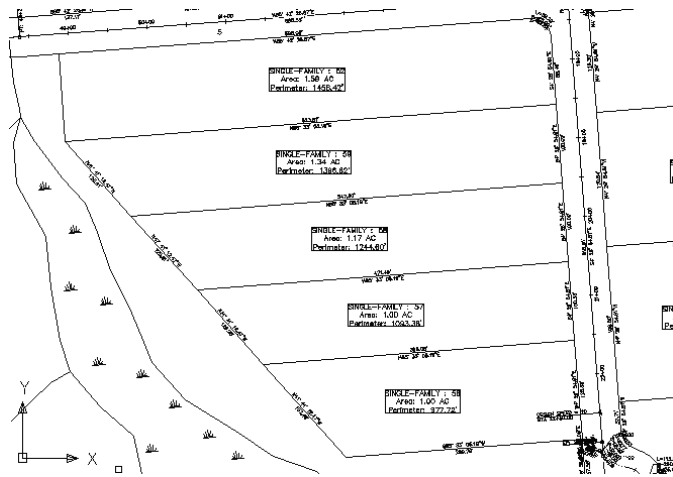


- Select **Slide Angle – Create** and accept the default options. Pick a point inside the large parcel as shown below.

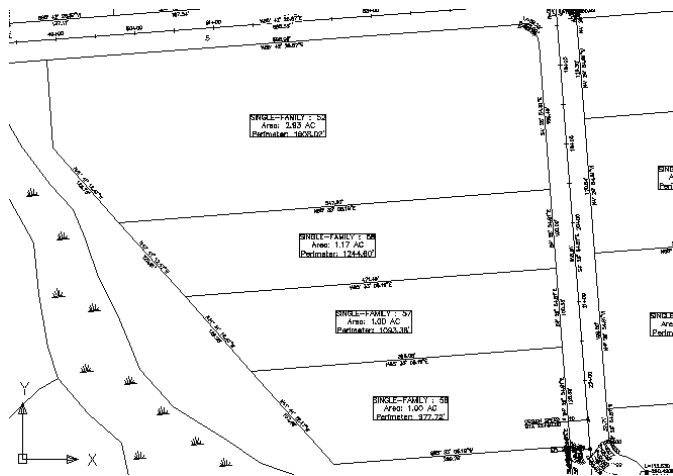


- Measure frontage at the circle shown above, and track frontage as shown with the arrow. Press <Enter> to accept the default angle and area prompt.

- The area should be subdivided as shown below. Once done, press <Esc> to cancel the **Create** command.

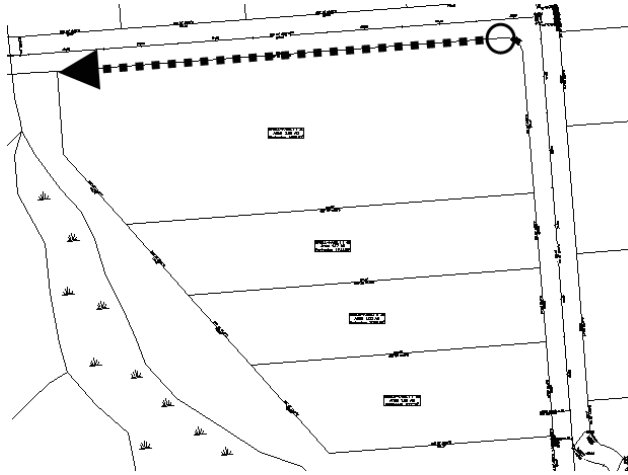


- To better distribute the area, delete the uppermost parcel line that was just created.

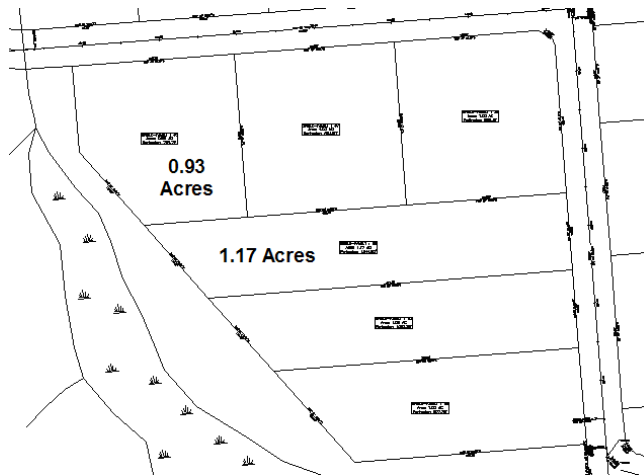



- Select **Slide Angle – Create** again and accept the default options.


9. When prompted, pick a point inside the larger of the four parcels shown below. Measure frontage at the circle and track frontage with the arrow shown below.

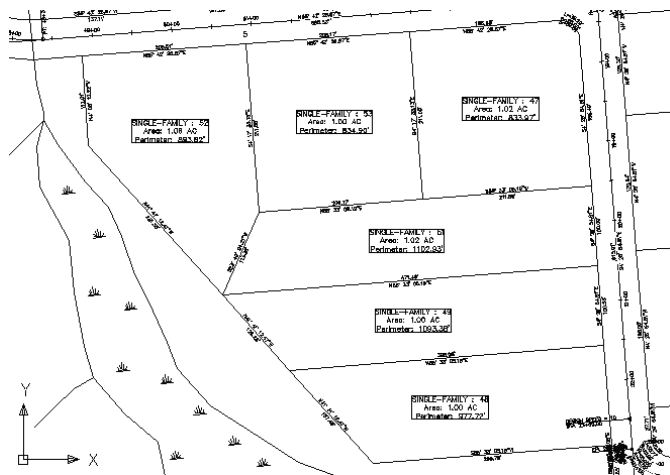
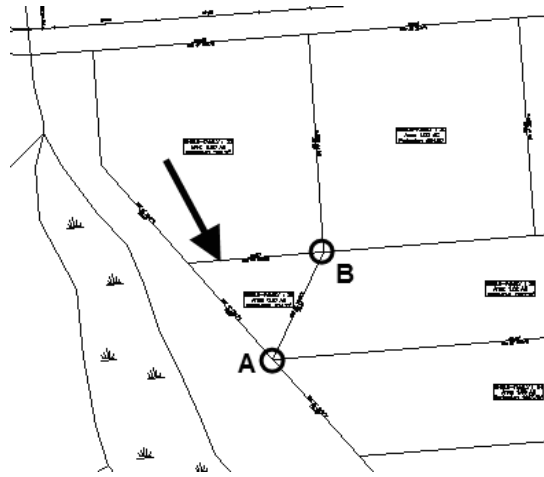


10. One parcel was drawn short of 1 acre, while an adjacent one was above 1 acre.



11. To redistribute, click  (Fixed Line – Two Points) in the Parcel Layout toolbar. Draw the new parcel line from the endpoint at A to the endpoint at B as shown below.

12. Click  (Delete Sub-entity) in the Layout toolbar and delete the parcel line, indicated below with the arrow.



13. Save the drawing.

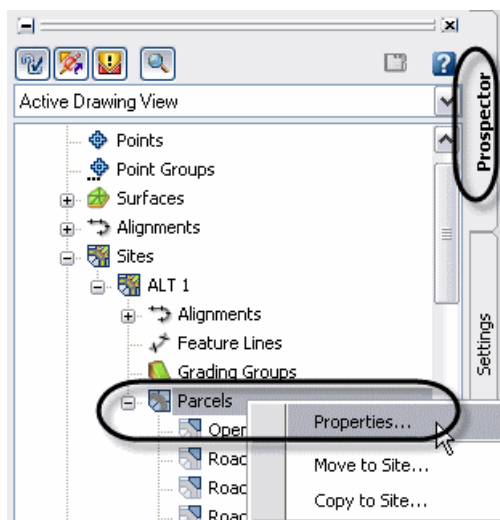
### Task 8 - Adjust Parcel Display order

1. In Prospector, select the large **Property: 2** parcel in the southwest corner of the site, right-click and select **Properties**.
2. In the *Information* tab assign it to have the **Open Space** style.
3. In the *Composition* tab note the parcel's area. This configuration resulted in approximately 1,082,000 ft<sup>2</sup> of open area (24.9 acres), or 44% of the total site. While acceptable, perhaps a different configuration could result in more lots.
4. Click **OK**.

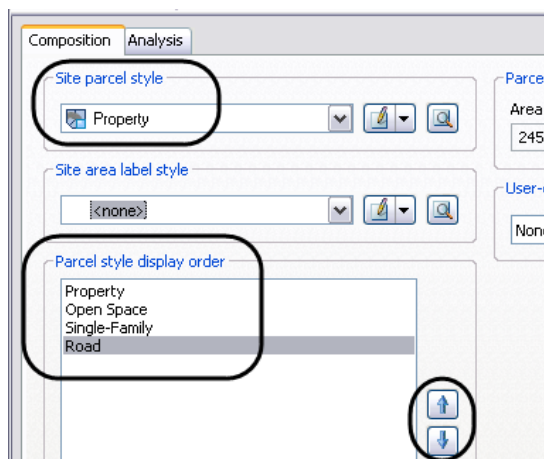


*As displayed, all parcel lot lines will be displayed at the same plotted weight. If you would prefer that the outside parcel segments have a different appearance, perhaps a heavier plotted weight, you can do so by changing the parcel style display order.*

5. Right-click on ALT 1's Parcels collection in the Prospector and select **Properties**.



6. In the *Composition* tab confirm that the *Site Parcel Style* is assigned to **Property**.
7. Using the arrows, arrange the display order to match that shown below and click **OK**. The cyan Property style should be visible along the outside of the subdivision plan.



8. Save the drawing.

## Self Check: Subdividing Parcels

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1. How do you create or subdivide parcels interactively?
2. Which **Parcel Create** command enables you to hold a specified angle relative to the right-of-way?
3. How do you adjust parcel display order?