

# End of Year Workshops – Statesville, Asheville, Wilmington and Raleigh NC

We are finally able to announce our end of year workshops for 2011. With the weather problems we encountered last year we decided to hold the events in the western end of North Carolina in November and toward the coast in December.

The cost to attend each event is \$99 and lunch is included. See below for early bird registration details for each event. NC Licensed Surveyors and Engineers will receive 8 PDH credits and all attendees will receive a certificate confirming their attendance. We will have door prizes, software giveaways and **special software or hardware pricing that is available the day of the show only.**

We will be in Statesville on Tuesday, November 15<sup>th</sup> and Asheville on Thursday November 17<sup>th</sup>. Early bird registration is \$89 through September 30<sup>th</sup>.

We will be in Wilmington on Tuesday, December 13<sup>th</sup> and Raleigh on Thursday December 15<sup>th</sup>. Early bird registration is \$89 through October 31<sup>st</sup>.

You will be able to choose the sessions you wish to attend. This year's sessions include:

- **GIS from A to Z and Responding to GIS-related RFPs**  
presented by Janet Jackson (GIS Janet) of Intersect
- **Overview of Carlson Takeoff & Preparing Machine Control**

## **Data**

presented by Todd Carlson of Carlson Software

- **Intro to SurvNet & Least Squares**

presented by Donnie Stallings, the original developer of the product

- **CAD Standards Roundtable & Discussion**

presented by Jennifer DiBona, That CAD Girl

- **CAD Tips & Tricks** and hints for sharing data with others

presented by Jennifer DiBona, That CAD Girl

- **Overview of Carlson Software 2012** (Survey, Civil, Hydro, GIS, Point Clouds)

presented by Scott Griffin of Carlson Software

- **Field to Finish with Carlson Survey & SurvCE and the Surveyor+ GPS System**

presented by Butch Herter of Carlson Software and Jeremy Taylor

- **Preview of future Carlson hardware**

presented by Butch Herter of Carlson Software and Jeremy Taylor

- **Road Design and Site Design with Carlson Civil & Hydrology**

presented by Scott Griffin of Carlson Software

Note that all classes are not scheduled at all events and locations. See each workshop announcement for specifics. Seats are limited so register online, call 919.417.8351 or email us to register.

---

# Picks and Clicks: Understanding Field to Finish

*This article originally appeared in the September 2011 issue of Professional Surveyor magazine.*

## Don't be intimidated!

**DEFINITIONS**  
**Field to Finish**—A general term used to describe the process of automatically drawing survey field data based on point descriptions and other field codes.  
**Field Code (Description Key)**—An alphanumeric code, corresponding to the point's description, that defines how points are processed using Field to Finish. For points to be sorted onto a particular layer, be included in a point group, have a symbol inserted, or have linework that connects points be automatically generated, a Field Code having the point's description must first be created.  
**Field Code File (Description Key File)**—A file that contains all of the Field Codes.  
**Linework Codes**—Codes entered before or after a point description that, when processed using Field to Finish, indicate where linework starts and ends or how to create additional, associated linework.

Somewhat like the seemingly Herculean task of developing CAD

standards that I wrote about in the June issue, Field to Finish is one of those topics that almost everyone attending my workshops or training classes wants to learn more about. If they are not using Field to Finish, they think they should be—and, if they are already using it, they think they could be doing more or doing it better.

For those who are unfamiliar with it, Field to Finish is a general term used to describe the process of automatically drawing survey field data based on point descriptions and other field codes.

Depending on the survey software you use, Field to Finish may include some or all of these tasks:

- insertion of survey points on to separate layers based on the point's description,
- sorting of points into point groups,
- “tagging” of points, based on the point description, as “non-surface” points (this means that the points, even if selected, will be ignored when building a surface model),
- insertion of a symbol onto a separate layer based on the point's description or note,
- rotation or scaling of a symbol based on the point's description or note, and
- drawing of 2D and/or 3D polylines connecting points based on the point's description or note.

Although most survey programs can perform these or other tasks that fall under the Field-to-Finish header, to my knowledge, Carlson Survey is the only one to have commands or files that are actually named “Field to Finish.”

Land Desktop and AutoCAD Civil 3D use the term “Description Keys” for their feature that sorts points onto separate layers and inserts, rotates, and scales symbols. A separate feature called “Automatic Linework” or “Process Survey Linework” generates the polyline figures in these programs. For purposes of this article, Field to Finish refers to the generic term and, unless otherwise specified, applies to any survey program.

## Benefits

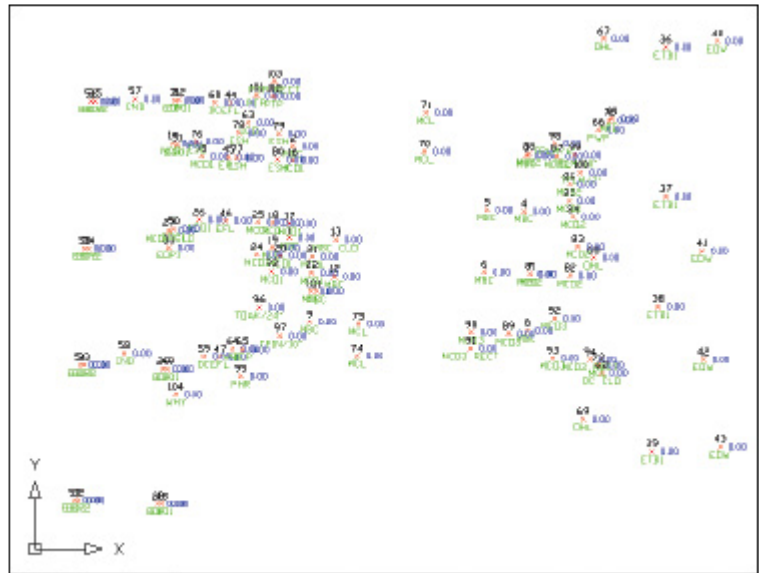


Figure 1

For those who have never used Field to Finish, it can be summarized in one word: intimidating! But once you see what can be accomplished with a little extra coding, I believe you’ll be convinced it’s worth it. Because a picture is worth a thousand words, it’s easier to show you the benefits of Field to Finish.

The generic command for importing points (rather than Field to Finish) was used to import the points in **Figure 1**. In addition to overlapping attributes that make it hard to read, the points are all on the same layer, making connecting the dots even more time consuming and difficult.

However, if you use Field to Finish to import the points into the drawing, it looks like **Figure 2**. The points have been frozen

in this view, but you can see the symbols and 2D and 3D linework that have been generated on their proper layers.

Granted, these examples demonstrate the power of Field to Finish when used to its fullest capacity, and it does require additional time and attention in the field to generate these results. In my training classes I encounter a lot of skepticism from folks who don't believe the extra

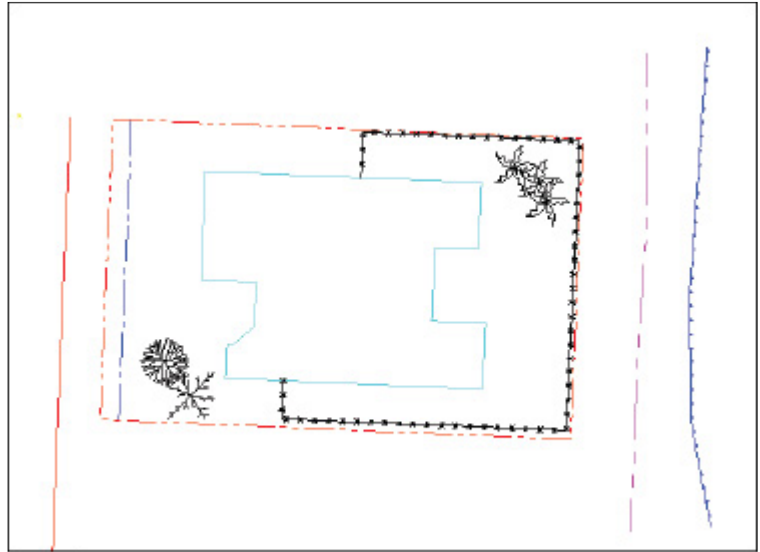


Figure 2

time in the field is worth it. While it may look cool, they say, it's just easier to sort to layers, insert symbols, and connect the dots manually back in the office.

## Bite-size Pieces

I respectfully disagree—and I believe that tackling significant changes in procedure is best accomplished with bite-size pieces rather than one big bite. Do you remember how you're supposed to eat an elephant? One bite at a time, of course!

- Nibble: Sort points onto separate layers and into point groups.
- Snack: Tag points such as fire hydrants and inverts of manholes as “Non-Surface” points.
- Bite: Specify symbols to be inserted on points where needed.
- The whole enchilada—er—elephant: Also use special linework

codes to connect points using lines or 2D polylines (for plan generation) and 3D polylines (for defining breaklines for surface models).

**Point Description Consistency** Regardless of the level of Field to Finish automation you strive for, the single biggest key to success with Field to Finish is consistency among the point descriptions. If you are attempting to implement Field to Finish for the first time and want to ensure buy-in from your field crews, allow them to help develop the list of descriptions. After all, they are the ones having to enter them in the field. If the folks in the field are not consistent with the descriptions they enter for each shot, Field to Finish is doomed to fail. For instance, in the office, it doesn't matter whether the description for a fire hydrant is "FH," "HYD," or "FIRE HYDRANT." Once the Field Code File has been created, it's simply a matter of processing the Field to Finish routine. So, rather than someone in the office dictating what descriptions the field crew should use, ask the crew what description makes most sense to them and what they are confident they can remember and enter every single time.

Even though the "nibble" part seems simple enough, it still requires a considerable amount of thought and consideration. So, how do you start? First, determine what descriptions will be used for shots taken in the field. In order to use Field to Finish, you will need to create a field code for each description that may be processed now or in the future.

Start by going back to one or two of the largest point files you've worked on recently and sort it out based on the point descriptions in it. Use this list as a guide to determine what descriptions to keep and what to throw out and also to trigger your memory for other descriptions that may be used in the future.

Once you've completed your list of descriptions, each description must be defined as a Field Code (Description Key) in the software. It's during this step that layers can be assigned for the points, symbols can be specified for insertion, point groups can be defined, and non-surface points can be tagged. Depending on the software you use, the dialog boxes and interface will be different, but the data and settings entered are generally the same.

For Carlson Software users, there is a routine in the "Draw Field to Finish" dialog box that automatically creates a Field Code Table (populated with Field Codes) from a Coordinate File. If you're not using Carlson Survey, I recommend opening your point file in Microsoft Excel to sift through and sort the list of descriptions.



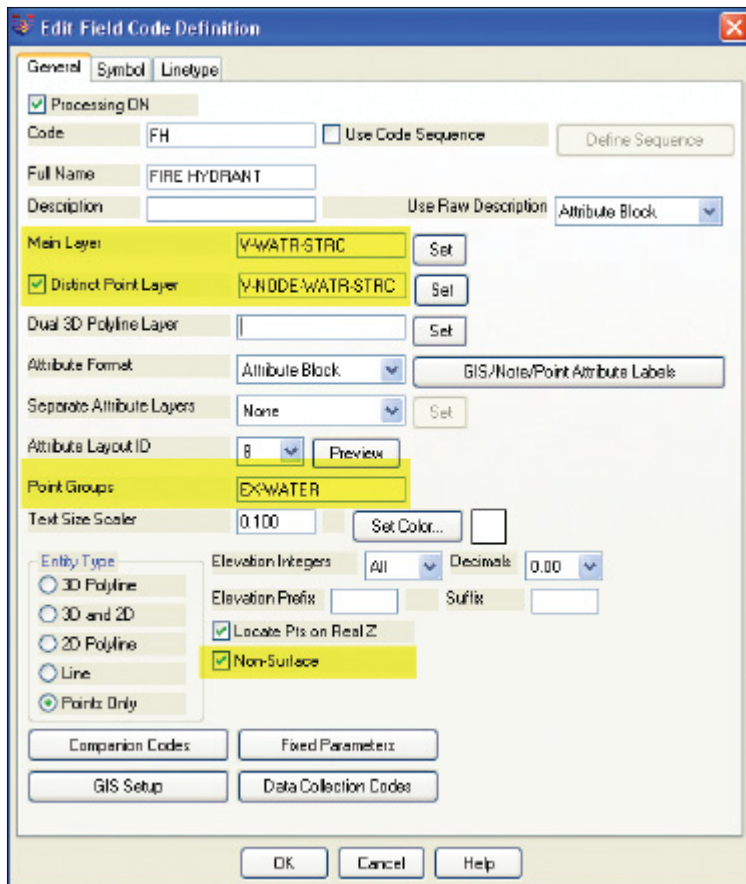


Figure 3

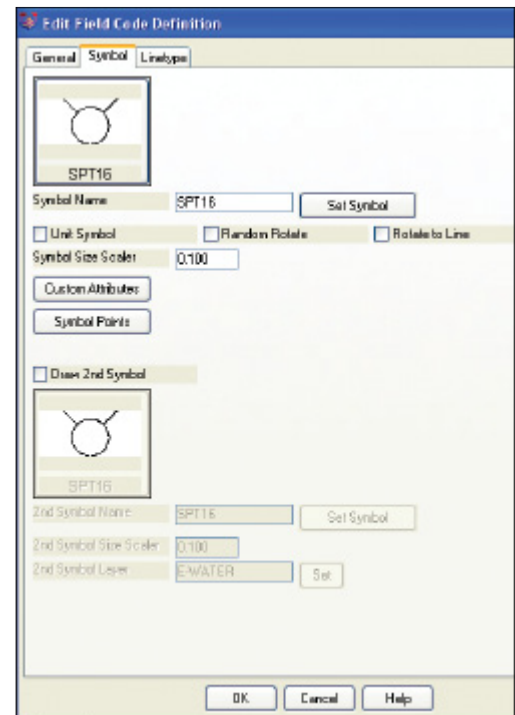


Figure 4

T

he Field Code that processes points with an FH description, as defined in Carlson Survey 2012, is shown in **Figure 3**. On the “General” tab of the dialog box, note the highlighted areas that show the layers, point group, and the checkbox to tag points as non-surface. Importing points with an FH description and using the “FH” Field Code definition results in the symbol named SPT16 being inserted on the layer V-WATR-STRC, the point being inserted on layer V-NODE-WATR-STRC, and the point included in a point group named EX-WATER.

The “Symbol” tab of the dialog box (**Figure 4**) is where you specify the symbol name and various other rotation, scale, and insertion settings.

# Connecting All Your Points

As I stated previously, it's a reasonable goal to get to the point where Field to Finish is used to sort points and/or symbols onto their proper layers and into point groups and to tag some points as non-surface to keep them from being included in a surface model. These are office-only tasks, because using Field to Finish to complete them does not require anything from the field crew other than consistency when entering point descriptions. However, the ultimate goal is having Field to Finish connect all of your points with 2D and/or 3D linework. Compared to the previous tasks, this requires more buy-in from the field crew because of the additional coding and noting.

In **Figure 5** you can see the linework coding that has been added to the "BOC" (Back of Curb) point descriptions in the sample of the point file. The "+7" linework code instructs the program to begin drawing linework, and the "-7"

```
120,4792.176208,4957.824633,97.596303,BOC PC
121,4793.754381,4972.426061,97.615739,BOC
122,4798.585633,4982.155822,97.951267,BOC
123,4809.212122,4990.296696,98.573121,BOC
124,4824.011982,4995.929299,98.952353,BOC PT
125,4888.297266,5002.679947,99.558188,BOC -7
```

Figure 5

instructs it to stop drawing that piece of linework. The "PC" and "PT" identify the starting and ending points of a curve that fit all points in between the PC and PT.

The Field Code that processes points with a BOC description is shown in **Figure 6**. If you use the linework codes from the point file along with the BOC Field Code definition, it results in a 2D polyline on layer V-ROAD-CURB-BACK that starts at point 119 and goes to point 120. Then it goes into a curve that best fits between points 120 and 124 and ends with another tangent line from point 124 to point 125. A 3D polyline connecting the same

points will also be drawn on layer 3D-EXISTING. In addition, the points will be inserted on layer V-NODE-CURB-BACK and included in a Point Group named EX-ROAD.

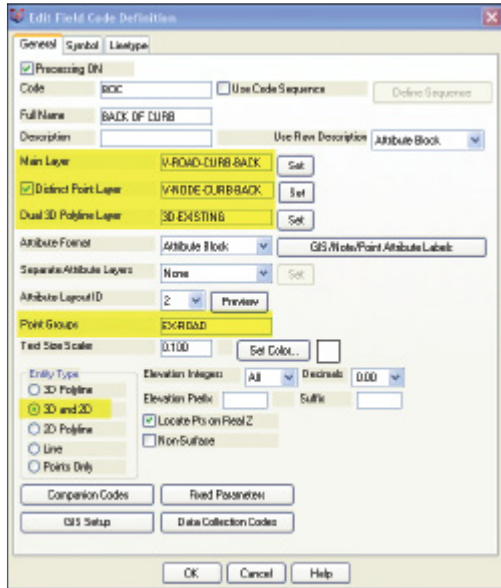


Figure 6

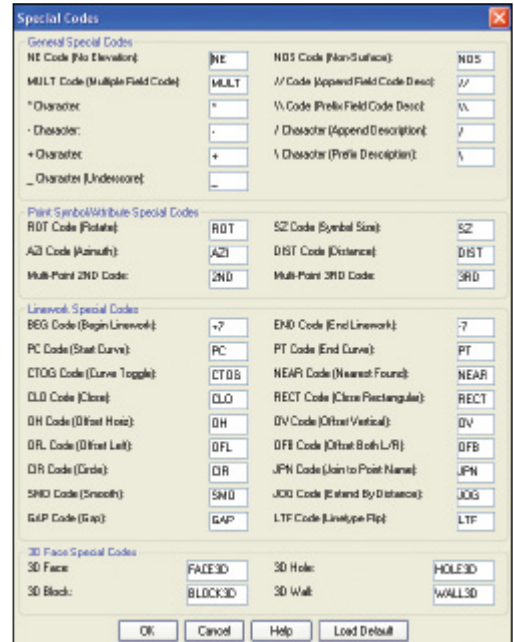


Figure 7

And this is just a sample of what can be done using Field to Finish. Depending on your software and data collector firmware, there are many other linework codes that can be used to automate the creation of linework based on your point descriptions and notes. In some cases there are specific linework codes that must be used, such as “B” for Begin linework (instead of the +7 used above) or “E” for End linework (instead of -7). Other programs, like Carlson, allow you to customize these codes. The “Special Codes” dialog box in **Figure 7** shows the default linework codes used in Carlson Survey 2012.

I have one last piece of advice for those who are considering jumping into the world of Field to Finish for the first time. Cheat! Well, kinda. Every survey program with a Field to Finish feature has sample files that you can use as-is or modify to meet your needs. Rather than starting from scratch, it's

sometimes easier to work with one of those prepared files.

As always, I encourage you to send your feedback or contact me with questions at [ContactUs@ThatCADGirl.com](mailto:ContactUs@ThatCADGirl.com).

*This article originally appeared in the September 2011 issue of Professional Surveyor magazine.*

---

# Picks and Clicks: The Key to Standardizing Annotation in CAD Files

*This article originally appeared in the June 2011 issue of Professional Surveyor magazine.*

## **Part 1**

The issue of CAD standards has long been one of my pet projects when working with clients. It's the universal problem, as folks from every office confess that CAD standardization is either "non-existent" or, at least, "could be better."

In my experience, the single most-intimidating aspect to developing a CAD standard is deciding how to standardize annotation in order to accommodate the multiple scale factors used in a typical plan set. Other types of sheets surveyors and civil engineers may have to produce are:

- a cover sheet (at 1:1 or no scale),

- one or more project or phase site plan sheet (at 1:50, 1:100, 1:500, 1:1000, etc.),
- plan and profile sheets (at 1:30, 1:50, etc.), and
- detail sheets (at 1:1 or no scale).

It's not an easy issue to resolve, and CAD programs seem to vary from bad to worse in their ability to manage multiple scales within a single CAD file.

Some of the information provided here is very basic, but in my experience even long-time CAD users struggle a bit with the "under-the-hood" details about annotation sizing. So, that being said, where should you start?

Determine the Plotted Size, Plotted Height, Plotted Distance ... of Everything

The most important first step when developing a CAD standard for annotation is to determine the desired plotted size of annotation entities. And, when we discuss annotation, we must remember that this encompasses more than just text; it also means linetype patterns and dimension styles.

Here are several sample questions to ask when developing a CAD standard for annotation:

- When plotted, what is the height (in inches) of the text displaying:
  - the project title in the title block?
  - the road name?
  - contour labels?
  - □property line bearings and distances?
- When plotted, how far off the property line (in inches)

- should the bearing and distance label be placed?
- When plotted, what is the distance (in inches) between labels along a contour?
- When plotted, what is the length (in inches) of the arrowheads at the end of dimension objects?
- When plotted, what is the distance (in inches) that the extension line extends beyond the dimension line?
- When plotted, what is the length (in inches) of the dashes and gaps in the linetype used to show existing contours?

Overwhelmed yet? Don't be. Once you commit to the size or height of a few entities, the rest come fairly easily just because you know that you want one entity a little smaller or a little bigger than another.

The remainder of this column covers the issue of standardizing text sizes in your CAD files. Future columns will cover the other questions relating to linetypes and dimension styles in much more detail.

## Standardizing Text Sizes and Placement

Although text height can be set to any desired value, the most commonly used height for plotted text in civil/survey drawings is 0.08". There are several other standard text styles (corresponding to the height of the plotted text), known as "Leroy," that have been adopted from the days of hand and technical lettering. Even though the "Leroy" text style usually has a Simplex font, the naming convention is widely accepted to describe text of a specific height regardless of its font. For instance, L80 text refers to a Leroy style text that plots 0.08"

Plotted Height	Leroy Name
0.040"	L40
0.050"	L50
0.060"	L60
0.080"	L80
0.100"	L100
0.120"	L120
0.140"	L140
0.175"	L175
0.200"	L200
0.240"	L240
0.290"	L290
0.350"	L350
0.425"	L425
0.500"	L500

Figure 1

high; L100 is Leroy with a plot height of 0.10"; and L200 is Leroy with a plot height of 0.20". Other standard heights and style names are shown in **figure 1**.

L80, or text that plots 0.08" high, is generally used for basic text such as bearings and distances, contour labels, and notes. For more prominent text such as road names or parcel numbers an L150, or text plotting 0.15", may be used.

You may be saying, "Yeah, that's great and all, but when I enter text it asks me for the height of the text to be placed in the drawing, not its plotted height." If you use the generic commands for placing text, that is true. However, most civil/survey programs have specialized commands for labeling that also take into account a horizontal scale that you specify independently for each drawing.

For instance, in Carlson Software or Civil 3D, you can specify program defaults so that bearing and distance labels always have a plotted height of 0.08". Then, as each new drawing is started, you set its horizontal scale. For a drawing with a horizontal scale set to 1"=50', the bearing and distance labels will be placed in the drawing at a height of 4.0' ( $0.08 \times 50 = 4.0$ ). For a drawing with a horizontal scale set to 1"=100', the bearing and distance labels will be placed in the drawing at a height of 8.0' ( $0.08 \times 100 = 8.0$ ). The plotted height never changes.

Consider what a written standard for annotation would look like if we did not base the standard on the plotted size but on the actual drawing size of text...

- In all 50-scale drawings, bearing and distance labels shall be placed in the drawing at 4.0' high.
- In all 100-scale drawings, bearing and distance labels shall be placed in the drawing 8.0' high.
- In all 50-scale drawings, all property corner labels shall



be placed in the drawing 3.0' high.

- In all 100-scale drawings, all property corner labels shall be placed in the drawing 6.0' high.
- Unless otherwise specified, all other text in a 50-scale drawing shall be placed in the drawing 4.0' high.
- Unless otherwise specified, all other text in a 100-scale drawing shall be placed in the drawing 8.0' high.

Now, with the understanding that all annotation sizes must be scaled by the horizontal scale, we can simply say:

- All road names shall be L150.
- All property corner labels shall be L60.
- Unless otherwise specified, all other text shall be L80.

As you can see, because the text sizes refer to a plotted height, it makes the writing of CAD standards for annotation remarkably easier.

It is also important to note that, when placing text in a drawing, parameters other than text height can be adjusted to

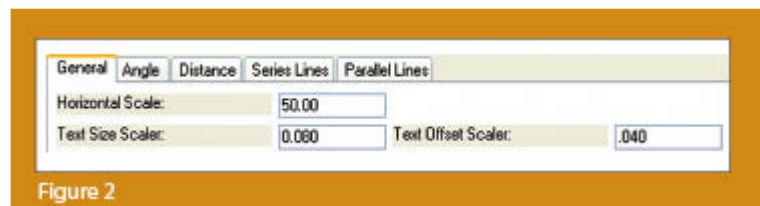


Figure 2

get the desired look. One of these parameters is the distance a label is placed above or below the line it labels. **Figure 2** shows a clip of the Annotate Defaults dialog box in Carlson Survey 2011.

The text height is specified using the “Text Size Scaler” value, and the distance that text is offset from the line it labels is specified by the “Text Offset Scaler.” Both of these values are “plotted” distances in inches. You can also see the horizontal scale setting for the drawing. Once plotted, text placed using these settings will be 0.08” high, and it will be positioned 0.04” off the line. A good rule of thumb is to set the offset



value at one half the text height.

Another example of an annotation standard that can be associated with a plotted distance is how far apart to place elevation labels along a contour. Rather than specifying that contour labels are “300’ apart in a 50-scale drawing” or “600’ in a 100-scale drawing,” your standard should state that: On the plotted sheet, contour labels shall be shown at 6” intervals along each index contour.

I hope this information has provided a good kick-start toward your CAD standardization goals and helps get you thinking in plot sizes rather than drawing sizes. As noted above, future columns will focus on other supposed standardization nightmares such as dimension styles and will also touch on some specifics of the different CAD programs. Please don’t hesitate to contact me if you have questions. I hope your summer is off to a great start!

*This article originally appeared in the June 2011 issue of Professional Surveyor magazine.*

---

## **That CAD Girl – April 2011 Newsletter**

Our April 2011 Newsletter can be downloaded [HERE](#)

---

# What is LandXML?

*This article originally appeared in the April 2011 issue of Professional Surveyor magazine.*

The ability to import and export LandXML data has been around for quite a while, but I still get a lot of curious looks when I mention it in my training classes. So, what is it, and why should you be using it?

## What Is LandXML?

LandXML refers to a file format (.xml) containing data that has been generated from a civil engineering or land surveying software program.

If you're hearing about it for the first time and want to learn more about the uses and acceptance of the LandXML initiative, visit [www.landxml.org](http://www.landxml.org). According to their page LandXML.org in a Nutshell, "... LandXML.org is committed to providing a non-proprietary data standard (LandXML), driven by an industry consortium of partners."

Simply put, the easiest way to convert, transfer, and archive data between Civil 3D, Carlson Software, Land Desktop, Eagle Point, TerraModel, and many other programs is to use the Import from LandXML and Export to LandXML functions available in these programs. Additionally, many machine control systems allow you to import LandXML files. I am most familiar with the Carlson and Autodesk families of civil/survey programs, so most examples in this article refer to them.

This may not be current by the time you read this article, but the list of members and participating organizations is at [www.landxml.org/org.htm](http://www.landxml.org/org.htm).

## Why You Should Use It To Transfer Data

The two key words in the mission statement above are “non-proprietary.” Just as we have multiple proprietary drawing file formats such as .dwg (from Autodesk’s AutoCAD-based programs) and .dgn (from Bentley’s Microstation), the files that store survey and civil data such as points, surfaces, centerlines, and profiles are unique and proprietary to their manufacturer.

For instance, Civil 3D is the survey/civil product for Autodesk. Points and surfaces created in that program are stored inside the .dwg file. If you have Civil 3D and need to share a surface with a consultant or other team member who owns the same version of Civil 3D, you can just send them the .dwg file and they will have full access to the point and surface data. However, if you have Civil 3D and your consultant uses an earlier version of Civil 3D, Land Desktop, or Carlson Software or needs the surface data for machine control, it will not be as simple as just sharing the .dwg file.

Similarly, surfaces created in Carlson Software are saved in a .tin file and points are stored in a .crd (coordinate) file. Anyone using Carlson Software or SurvCE data collectors can load these files in their native format. But, Civil 3D or other survey/civil programs can’t access them directly.

As you probably already know, when you have to pass this data onto someone using a different program, it’s a nightmare! This is where LandXML is a lifesaver.

I like to explain that you use Land-XML files in the same way you used to rely on .dxf files. It’s mostly outdated now, but a .dxf file is a generic drawing file (DXF = Drawing Interchange File) that can be exported from and imported into various CAD programs. Back in the day, AutoCAD wasn’t able to read or import Microstation’s .dgn files and Microstation wasn’t able to read

or import AutoCAD .dwg files, but both could export and read .dxf files. To get a Microstation file into AutoCAD, we had to export a .dxf file from Microstation and import it into AutoCAD and vice versa.

When you export your civil/survey data to an .xml file, it can be opened and read like a text file. Specifically, an .xml file is an .html file that is best viewed through a web browser such as Internet Explorer or Firefox. For instance, when a surface model (TIN) is exported to an .xml file, the X, Y, Z

```
- <Surfaces>
- <Surface name="EG">
- <Definition surfType="TIN" area2DSurf="20450222.7849" area3DSu
- <Pnts>
<P id="1">380922.103615 2506607.732735 41.2000</P>
<P id="2">380958.246247 2506310.293473 41.8000</P>
<P id="3">380859.633631 2506378.192599 41.5000</P>
<P id="4">380838.498931 2506251.881151 41.9000</P>
<P id="5">380882.693158 2505926.626756 39.1000</P>
<P id="6">380718.271495 2505653.604033 40.5000</P>

<P id="718">378567.822385 2507508.683806 43.4271</P>
<P id="719">378259.641925 2508097.744016 24.9615</P>
<P id="720">378275.784642 2507466.855049 41.5605</P>
<P id="721">378330.412304 2507452.367010 42.2912</P>
<P id="722">378736.948749 2507695.651850 41.7908</P>
</Pnts>
- <Faces>
<F>21 20 19</F>
<F>713 104 106</F>
<F>132 107 106</F>
<F>12 11 10</F>
```

values of each point on the TIN are assigned a number, and then each “face” (triangle) of the TIN is defined by specifying the three corners (**Figure 1**).

Another benefit of using LandXML to transfer project data is that you can be selective in choosing what project data to include in your .xml file. For instance, in the course of a design project, you may create an existing ground surface, a proposed ground surface for phase one of your project, and a proposed ground surface for phase two. You may have a consultant who needs only your proposed ground surfaces. When you export the .xml file, you have the ability to select only those surfaces that you’d like to add to the file; it’s not necessary to export them all.

## For Project Archiving

We’ve all become accustomed to saving archive copies of our

drawing files for various purposes, but saving the corresponding project data such as points, point groups, surfaces, centerlines, and profiles is often overlooked. Retrieving the drawing file (.dwg or .dgn) may allow you to recover the linework that represents contours or a profile, but the underlying “surface” is lost unless the project data was also archived.

When archiving your projects at completion or even at submittal time, it is not enough to simply save a copy of the drawing file(s) for the project; you must also save a copy of the project data. At a minimum, the archive should contain the project data in its native format. In the case of Civil 3D, saving your project data in its native format means saving a copy of all .dwg files that store points, surfaces, or other data relating to your project. Saving this project data in its native format is sometimes the easiest method, but it can also create a problem with file storage because the files can become enormous.

This won't be a surprise, but even if you archive your project data in its native format, I recommend that you consider additional archiving in .xml format. This is the case whether you need to save a progress, submittal, or final archive of your data. No one knows what kind of data files we'll be using 10 or 20 years down the road, so saving your data in such a generic, text-based format such as .xml files allows for easier retrieval regardless of when you need it.

Note that, like archiving in native format, archiving to an .xml file can also produce very large files. I still believe using the .xml format is advantageous because of the generic nature of the data and having the ability to pick and choose the data you need to archive.

I hope you've gotten some clarification on this fantastic tool we've all had for years but many of us have not taken advantage of. If you have questions, please don't hesitate to follow up.

*This article originally appeared in the April 2011 issue of Professional Surveyor magazine.*

---

# Join Us For A Technology Breakfast – Various Breakfast Spots in North and South Carolina

Starting in April 2011 we will be hosting a “Technology Breakfast” for current and/or prospective Carlson Software and hardware customers.

These events will be held on the 3<sup>rd</sup> and 4<sup>th</sup> Friday of each month and will start at 7:30am. Once a month we will meet at the Cracker Barrel at I-40 in Garner, North Carolina. Other events will be held in various locations in North and South Carolina.

Each breakfast and meeting will last for 1-2 hours and will provide an opportunity for us to demonstrate the future direction of Carlson data collection and field hardware. After breakfast, we will retreat to the parking lot for the field demonstration. Some events will also have a classroom component in a conference room at a neighboring hotel.

Technology Breakfasts will be free of charge but **pre-**

**registration is required.** Call us at 919.417.8351 or email ContactUs@thatcadgirl.com. There is a limit of 10 people at each meeting.

The full list and details for Technology Breakfast meetings can be found [here](#).

Apr 22 <sup>nd</sup>	Cracker Barrel at I-40 in Garner, North Carolina.	May 13 <sup>th</sup>	Cracker Barrel at I-85 in Gastonia North Carolina	May 20 <sup>th</sup>	Cracker Barrel at I-40 in Garner, North Carolina	June 17 <sup>th</sup>	Cracker Barrel at I-40 in Garner, North Carolina	June 24 <sup>th</sup>	Cracker Barrel at I-77 in Columbia, South Carolina
-------------------------	--	-------------------------	---	-------------------------	--	--------------------------	--	--------------------------	---

Keep checking our training page for more details about the new hardware or software to be presented at each event and for additional meetings planned for Asheville, Morehead City, Hickory and Wilmington, North Carolina.

---

## Upcoming FREE Webinar

### Future Directions of GIS for Surveyors, Engineers & Construction Professionals

Presented by Janet Jackson (GIS Janet) of Intersect and Gary Rosen of Carlson Software..

This one hour webinar is intended to de-mystify the world of GIS for surveyors and engineers needing to learn more about this alternate universe.

For the initial part of the presentation by Janet, I’ve asked

her to address, briefly, three questions:

1. Why do surveyors, engineers and construction professionals need to know about GIS? And, how can it help us?
2. When an RFP (Request for Proposal) has a “GIS Component” requiring a GIS deliverable, what does that mean and what should we look for?
3. As surveyors, engineers and contractors using Carlson Software, what are some fairly easy “value-added” services we could offer to existing and potential clients to generate new business?

Following Janet’s presentation, Gary Rosen with Carlson Software will discuss the new technology currently in the market from Carlson and what may be coming down the line.

Register for the April 27<sup>th</sup> Webinar [Here](#)

---

## **Upcoming Regional Training Classes – Columbus OH, Raleigh NC, Atlanta and Baltimore**

After many requests to hold training classes in different areas of the country, I’ve finally managed to schedule a few dates. The classes are 8 hours of hands-on training and seats are limited. Registration deadlines and pre-requisites vary for each class – Click the link below for the class announcement.

Classes include Intro to Survey, Surface Modeling, Least Squares/SurvNet, Quantity Takeoffs and Drawing Prep for Surface



Modeling among others.

Call 919.417.8351 or [ContactUs@thatcadgirl.com](mailto:ContactUs@thatcadgirl.com) to register.

- May 2-3 – Columbus, Ohio
- May 16-18 – Raleigh, North Carolina
- May 23-25 – Atlanta, Georgia
- June 1-2 – Raleigh, North Carolina
- June 14-16 – Baltimore, Maryland

---

## Meet Jeremy Taylor – Now Helping Me Out with Hardware & Data Collection

I'm happy to announce that Jeremy Taylor, PLS of Taylor Land Consultants has agreed to start helping me out with Carlson Software, data collector, GPS and other hardware sales. I asked him if he'd mind pitching his voice higher as he answered the phone:

Having never been a practicing land surveyor, I have not been able to promote or discuss Carlson's stable of data collection software or hardware as well as I'd like. I have hoped to find someone who knew the products well and could present them well, but was not a salesman. I think Jeremy will be the perfect fit.

He is very well-known and just as well-respected here in the Raleigh NC area and, I believe, will be a great resource for all of us. Like me, Jeremy is a fan of Carlson's offerings but is more concerned with providing the right solution for our

customers rather than simply trying to sell the latest and greatest piece of equipment. Please take a moment to read Jeremy's Bio [here](#).

If you have questions on SurvCE, Carlson Survey, data collectors or GPS equipment, please feel free to contact Jeremy at (919) 335-3444 or email him at [surveyor.gps@gmail.com](mailto:surveyor.gps@gmail.com). Going forward I think you can expect to see more of a focus on these products including special pricing and field demonstrations.

---

## Picks and Clicks: Conquer Problem Drawings

*This article originally appeared in the February 2011 issue of Professional Surveyor magazine.*

*While working with IntelliCAD, AutoCAD, or any other AutoCAD-*

*based programs, we've all encountered the proverbial drawing from "you-know-where" that seems to drive us crazy from start to finish. Here I offer several tips to help you identify problems and conquer your problem drawings. I've listed these tips in the order I would apply them.*

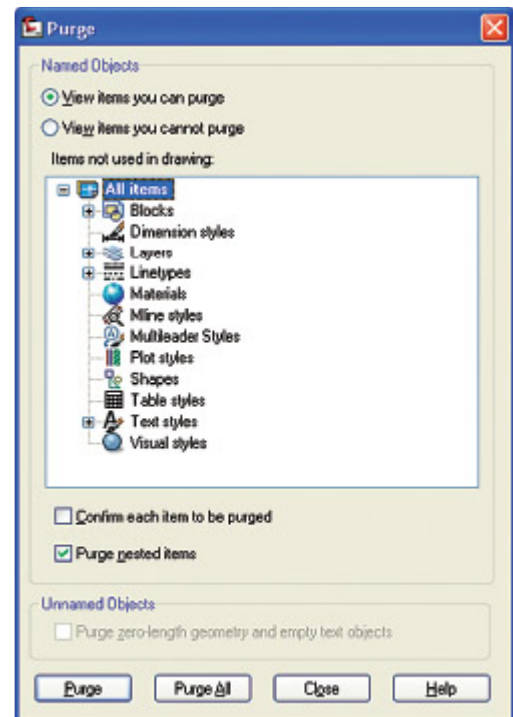


FIGURE 1: Purge dialog box

## 1 Purge your drawing.

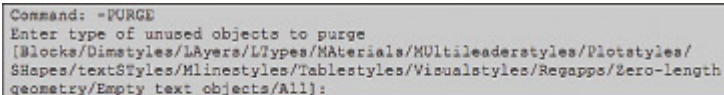
The PURGE command removes any unused layers, linetypes, text styles, shapes (for linetypes and text), and many other items in the drawing.

When you run the purge command once, it will purge those items that are not currently in use and that have no other dependencies. For example, if a particular linetype definition depends on a particular shape, the purge command will delete the linetype definition only on the first pass.

Purging again will now delete the shape because the dependent linetype no longer resides in the drawing. Enabling the option to "Purge nested items" before purging will automatically execute the command repeatedly until all unused and dependent items are gone.

## **2 Purge remnants of registered applications that have accessed your drawing.**

Typing “-PURGE” will execute the command line version of the purge command. This version includes a few options not available from the purge dialog box.



```
Command: -PURGE
Enter type of unused objects to purge
[Blocks/Dimstyles/Layers/LTypes/Materials/Multileaderstyles/Plotstyles/
SHapes/textStyles/Mlinestyles/Tablestyles/Visualstyles/Regapps/Zero-length
geometry/Empty text objects/All]:
```

FIGURE 2

One of the extra options is “Regapps,” which is available only from the command line version of the command. You access it by typing “R” when prompted. This option removes “leftover” data from other programs (registered applications) that have been used to work on the drawing file.

## **3 Audit the drawing.**

The AUDIT command looks for discrepancies between the objects displayed on the screen and the objects’ definitions in the drawing file database. The command then gives you the option of correcting the errors it has found. This command can be executed only while the drawing is open and active.

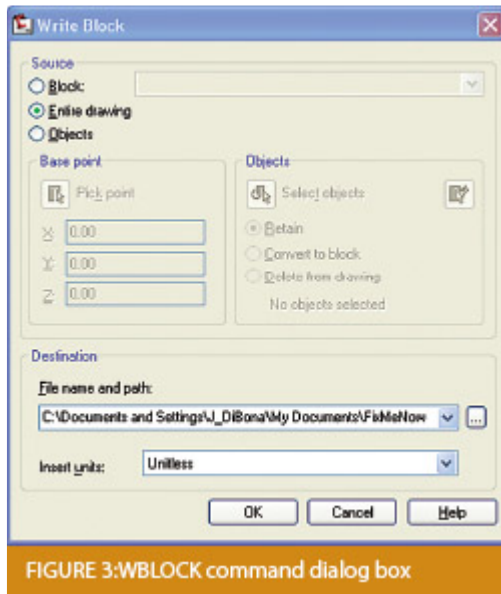
## **4 Recover the drawing and all reference files.**

The RECOVER command is a more robust version of the audit command and can be used to open drawings that are so corrupt they cannot be opened otherwise.

Starting the recover command prompts you to browse to and select the problem drawing. If the problem drawing is already open and

active, recover will prompt you to save changes before reopening the drawing and starting the recovery process.

For drawings that have attached XREFs (external references), use the RECOVERALL command to open and repair the selected drawing plus all dependent XREFs. Note that errors corrected by the audit are not saved back to the XREFs.



## 5 Block out the drawing contents to a new drawing.

If you suspect a drawing has become corrupt, you can WBLOCK the entire drawing out to another file. After starting the wblock command, set the “Source” option as “Entire Drawing” and provide the location and name for the newly created file.

Note that this command saves only Model Space entities to the new drawing. If needed, use AutoCAD Design Center to transfer layout tabs.

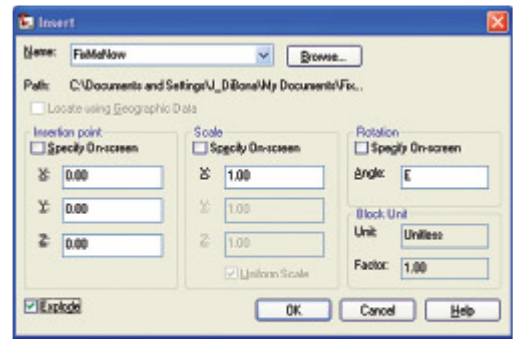


FIGURE 4: Insert Block command dialog box

## 6 Insert the problem drawing as a block into a new drawing.

Using the same principle as above, you can use the INSERT command to bring the Model Space contents of a problem drawing into another drawing. Doing this will reduce or eliminate corruption in the problem drawing.

Make sure to use 0,0,0 as the insertion point and set the rotation angle and scale appropriately.

As with wblock, this command saves only Model Space entities to the new drawing. If needed, use AutoCAD Design Center to transfer Layout tabs.

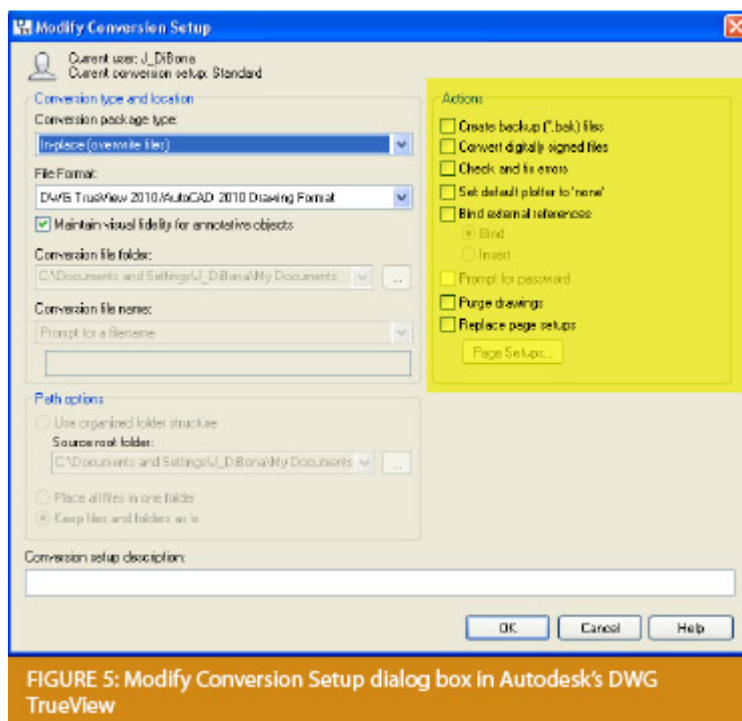
## 7 Export drawings from vertical programs to AutoCAD.

Autodesk products such as Land Desktop or Civil 3D create program-specific, proprietary entities such as AEC Contours and AEC Point Objects. These proprietary objects can become corrupt or otherwise create problems when being accessed from standard AutoCAD or another program that doesn't recognize the proprietary entities.

You can enter the -EXPORTTOAUTOCAD command at the command line

to create a new drawing file that strips out the proprietary entities and leaves only standard AutoCAD entities. For instance, a Land Desktop or Civil 3D drawing containing AEC Contour entities will result in elevated polylines with text when exported to Autocad. And a Land Desktop or Civil 3D drawing containing AEC Point entities will result in a block with attributes when exported to AutoCAD.

Note that any AEC Objects will obviously lose their intelligence, but the new drawing can be opened in any version of Autocad.



## 8 Use DWG TrueView Convert to fix errors and bind XREFs.

DWG TrueView is a free program that you can download from Autodesk's website. It is most valuable for its ability to convert drawings to earlier versions individually or in bulk. In the Conversion Setup dialog box, you can specify one or more options to clean drawings during the conversion process.

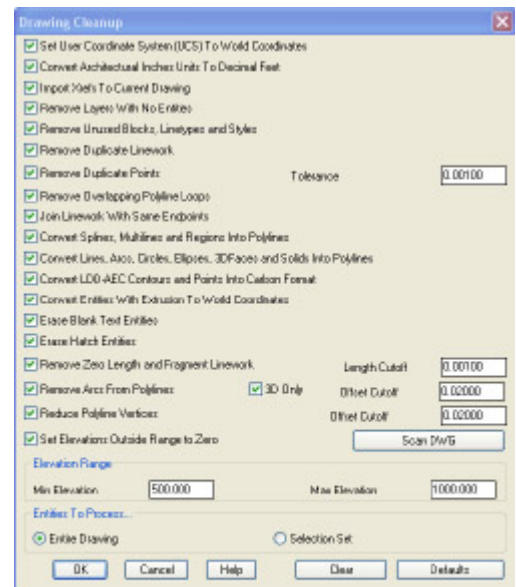


FIGURE 7: Carlson Software Drawing Cleanup dialog box

## 9 Use the Drawing Cleanup command in AutoCAD Map or Carlson Software.

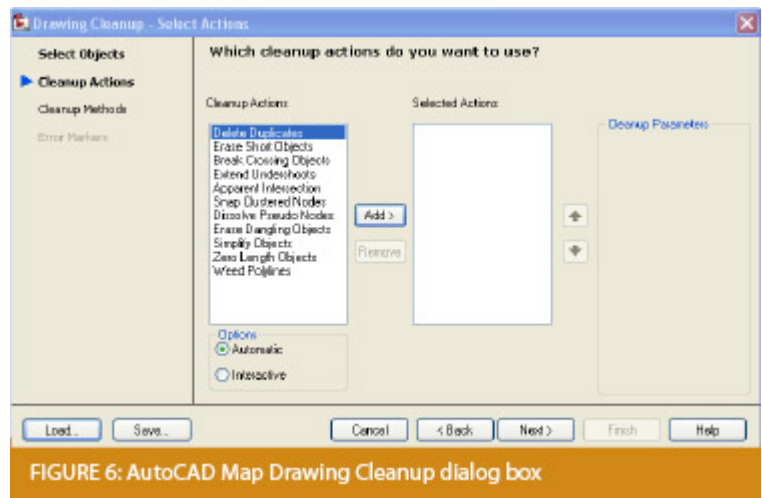


FIGURE 6: AutoCAD Map Drawing Cleanup dialog box

Both AutoCAD Map and Carlson Software provide Drawing Cleanup commands that provide a variety of cleanup tools. In either version, you have the option of performing one or more cleanup tasks on the entire drawing or on only selected entities in the drawing.

Note: Use these commands with caution and apply cleanup options



incrementally to avoid making unwanted changes. Also, I recommend making a backup copy of the active drawing before performing this command.

If you use AutoCAD Map, Land Desktop, or Civil 3D, you can access the Drawing Cleanup command from Map → Tools. In Carlson Software, access it from the File menu.

## 10

I've come up with 9 tips that will help you clean up and, maybe, access drawings that have become corrupt. To round out the list and make it an even 10, I'd like to hear from readers to find out what your favorite drawing recovery and cleanup tools are. Please email me at [ContactUs@thatcadgirl.com](mailto:ContactUs@thatcadgirl.com) and I'll report in a future column.

*This article originally appeared in the February 2011 issue of Professional Surveyor magazine.*