End of Year Workshops – New format for 2013

October 21, 2013
After several years of the same format for our end of year workshops, we've changed it up a bit this year.

For the first time, we will have one full day in both Statesville and Raleigh NC dedicated to Surveying and GIS topics and an additional day focusing on Civil and Hydrology topics. Each day will also include a unique presentation of the popular CAD Tips & Tricks session that, hopefully, sends everyone home with something they can use the next day.

In addition, we're conducting 1/2-day events in Wilmington and Hendersonville (Asheville area) covering a variety of topics.

Each full-day class will give NC licensed surveyors and engineers 8 PDH credits and the 1/2 day events are eligible for 4 PDH credits. All events include lunch, software pricing specials and giveaways.

That CAD Girl

November 11th, Hendersonville NC – $49 for 4 PDH credits
Download Hendersonville (Asheville) Announcement Here
Register for Hendersonville (Asheville) Workshop Here

November 12th, Survey & GIS Workshop, Statesville NC – $99 for 8 PDH credits
Download Statesville Survey/GIS Announcement Here
Register for Statesville Survey/GIS Workshop Here

November 13th, Civil & Hydrology Workshop, Statesville NC – $99 for 8 PDH credits
Download Statesville Civil/Hydro Announcement Here
Register for Statesville Civil/Hydro Workshop Here

December 9th, Wilmington NC – $49 for 4 PDH credits
Download Wilmington Announcement Here
Register for Wilmington Workshop Here

December 11th, Survey & GIS Workshop, Raleigh NC – $99 for 8 PDH credits
($89 registration thru 10/31/2013)
Download Raleigh Survey/GIS Announcement Here
Register for Raleigh Survey/GIS Workshop Here

December 12th, Civil & Hydrology Workshop, Raleigh NC – $99 for 8 PDH credits
($89 registration thru 10/31/2013)
Download Raleigh Civil/Hydro Announcement Here
Register for Raleigh Civil/Hydro Workshop Here

Did you know… about the new rainfall libraries in Carlson Hydrology 2013?

October 21, 2013
With the 2013 release of Carlson Hydrology, Carlson is shipping complete rainfall libraries for the following cities in North Carolina:

- Asheville
- Cary
- Chapel Hill

- Charlotte
- Concord
- Durham
- Fayetteville
- Gastonia
- Greensboro
- Greenville
- High Point
- Jacksonville
- Raleigh
- Rocky Mount
- Wilmington

The rainfall information has been compiled from the precipitation intensity charts available from The National Weather Service.

To load and access these files:

- Switch to your Carlson Hydrology menu
- Go to Network > Sewer Network Libraries > Rainfall Library
- Pick the Load button
- Browse to C:Carlson ProjectsSettingsNorth Carolina

Carlson Software Manuals

October 21, 2013
Looking for Carlson Software manuals? Prior to the 2010 release, Carlson included printed manuals with your purchase and, in addition, the manuals have always been available to print for yourself from the Help files.

With the 2010 release, Carlson "opened" a storefront on the self-publishing site called Lulu.com. You can order 2009 and 2010 Carlson Software manuals here http://stores.lulu.com/carlsonsw.

Originally posted on **Carlson Connection** by Jennifer Dibona

How Does Carlson Support Their Users? Ask David Farina

October 21, 2013

I'm going to post a LONG email stream between one of my clients, David Farina, Bruce Carlson and Dave Carlson. You can see the new feature that David requested and Bruce and Dave's responses. David received a "development" version of the new features approximately a week after submitting this request.

I asked him for a statement describing his experience with Carlson:

> *Recently I found that the Time of Concentration input boxes were inadequate under the hydrology portion of Carlson Civil Suite so I emailed a description of the problem to them. I was very impressed to get a phone call the same day. They discussed the problem with me and had a revised program update to me in under a week. I've been emailing*

Autodesk for over a year on problems with Civil 3D and never heard a peep. Needless to say I'm very happy with the customer service I have received from Carlson thus far.

Here is the original question from David Farina on March 4, 2009:

Jennifer,

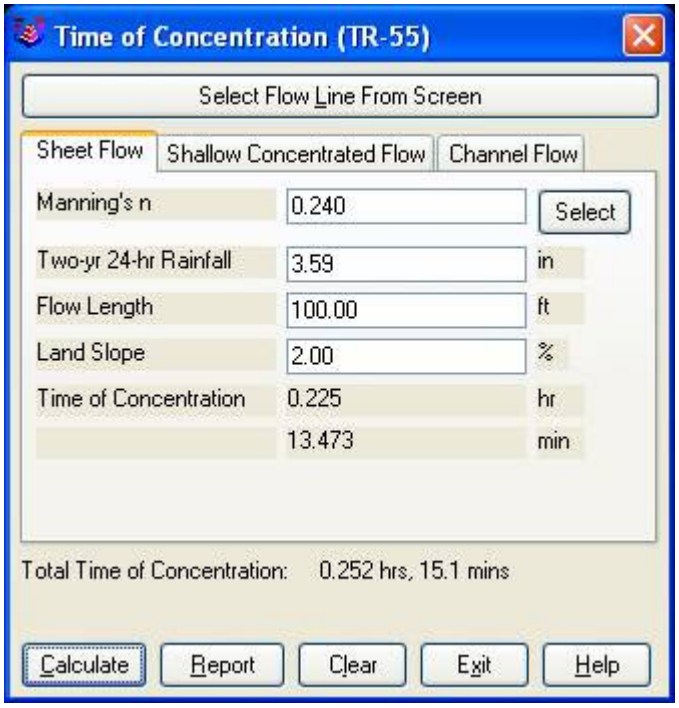
I was going through a mock project to learn the hydrology part of Carlson and noticed a critical deficiency in Time of Concentration input. The review agencies around here want to see the TR-55 method. First, the TR 55 minimum sheet flow needs to be 100' instead of 300'. They recently changed it per the TR-55 Web site. Second, I don't think I've ever had a project where you didn't have to split one of these flow types into 2 or more mannings roughness areas.

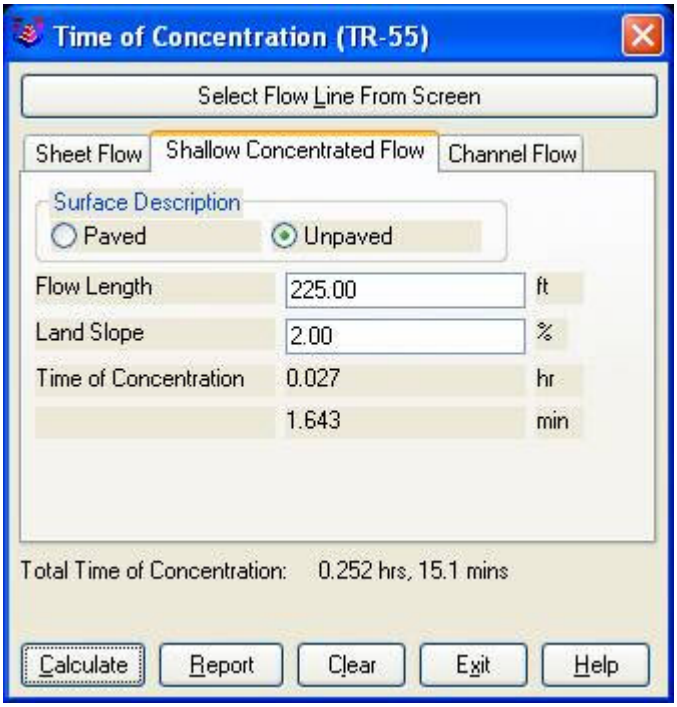
For example: a flow path that starts on dense grass for 50' then passes over asphalt for 75' and back to grass for 200' would need to be calculated as follows:

Sheet flow 50' Grass -> Sheet flow 50' Asphalt -> Shallow

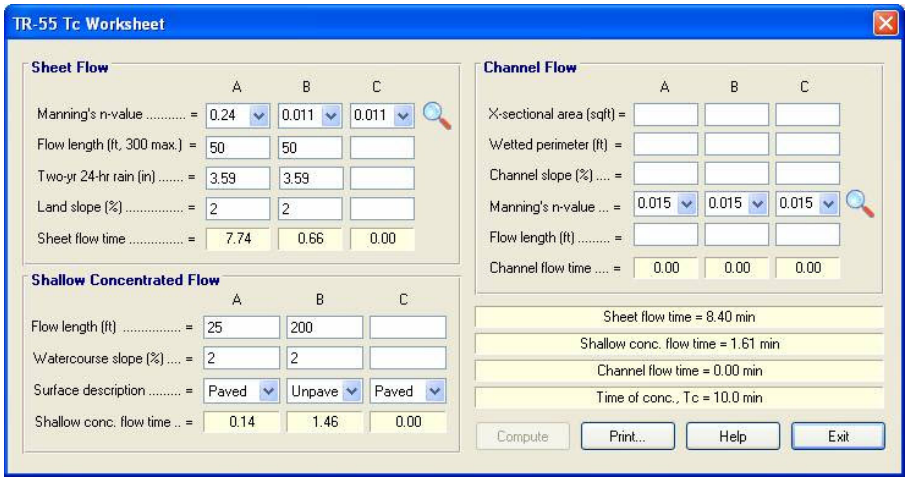
Concentrated flow 25’ Paved -> Shallow Concentrated flow 200’ UnPaved.

But as you can see the Carlson input only allows for one entry per flow type.

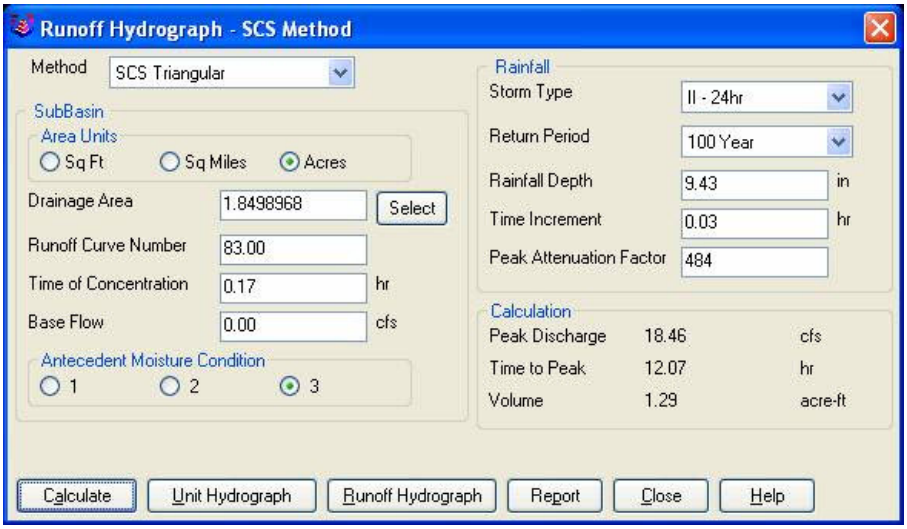


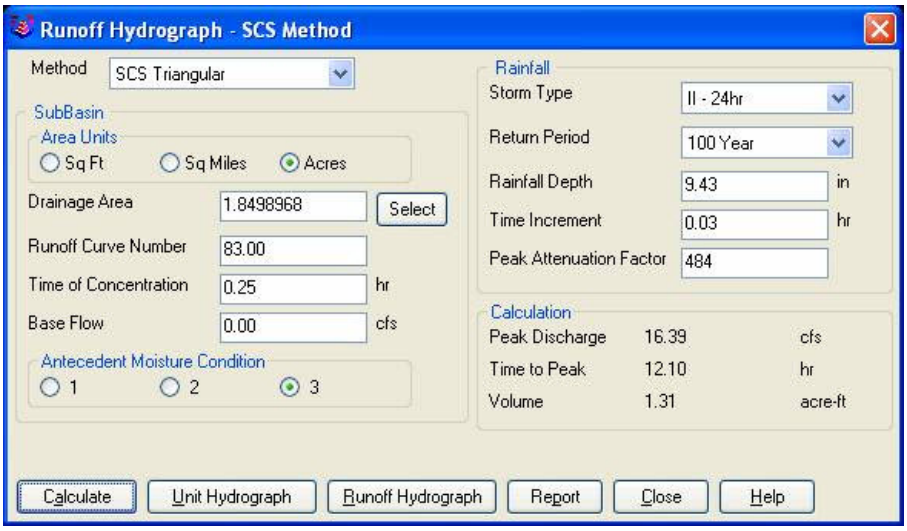


Below is the Intellisolve version: Notice the A, B C

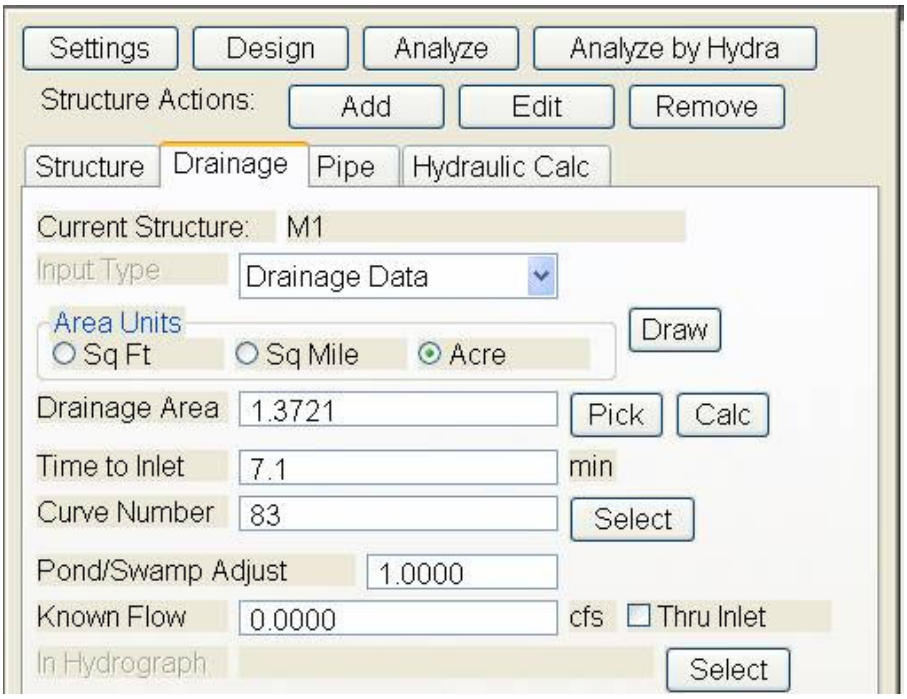


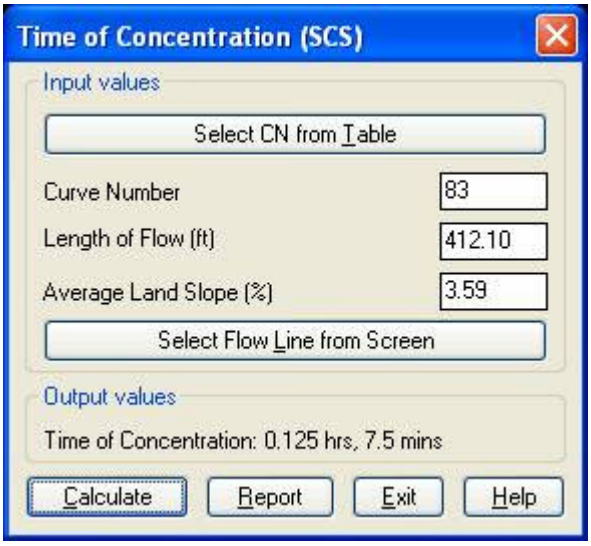
There is a 5.1 minute difference in TC results which results in a 2 CFS difference in the 100yr example below:


Runoff Hydrograph - SCS Method
Method
SCS Triangular
SubBasin
Area Units
Sq Ft
Sq Miles
Acres
Drainage Area
1.8498968
Select
Runoff Curve Number
83.00
Time of Concentration
0.17
hr
Base Flow
0.00
cfs
Antecedent Moisture Condition
1
2
3
Rainfall
Storm Type
II - 24hr
Return Period
100 Year
Rainfall Depth
9.43
in
Time Increment
0.03
hr
Peak Attenuation Factor
484
Calculation
Peak Discharge
18.46
cfs
Time to Peak
12.07
hr
Volume
1.29
acre-ft
Calculate
Unit Hydrograph
Runoff Hydrograph
Report
Close
Help


Runoff Hydrograph - SCS Method
Method
SCS Triangular
SubBasin
Area Units
Sq Ft
Sq Miles
Acres
Drainage Area
1.8498968
Select
Runoff Curve Number
83.00
Time of Concentration
0.25
hr
Base Flow
0.00
cfs
Antecedent Moisture Condition
1
2
3
Rainfall
Storm Type
II - 24hr
Return Period
100 Year
Rainfall Depth
9.43
in
Time Increment
0.03
hr
Peak Attenuation Factor
484
Calculation
Peak Discharge
16.39
cfs
Time to Peak
12.10
hr
Volume
1.31
acre-ft
Calculate
Unit Hydrograph
Runoff Hydrograph
Report
Close
Help

If the above example is that different then I am also concerned about how the Time to inlet is calculated in the example below:





Was the SCS method used to get the 7.1 min value?

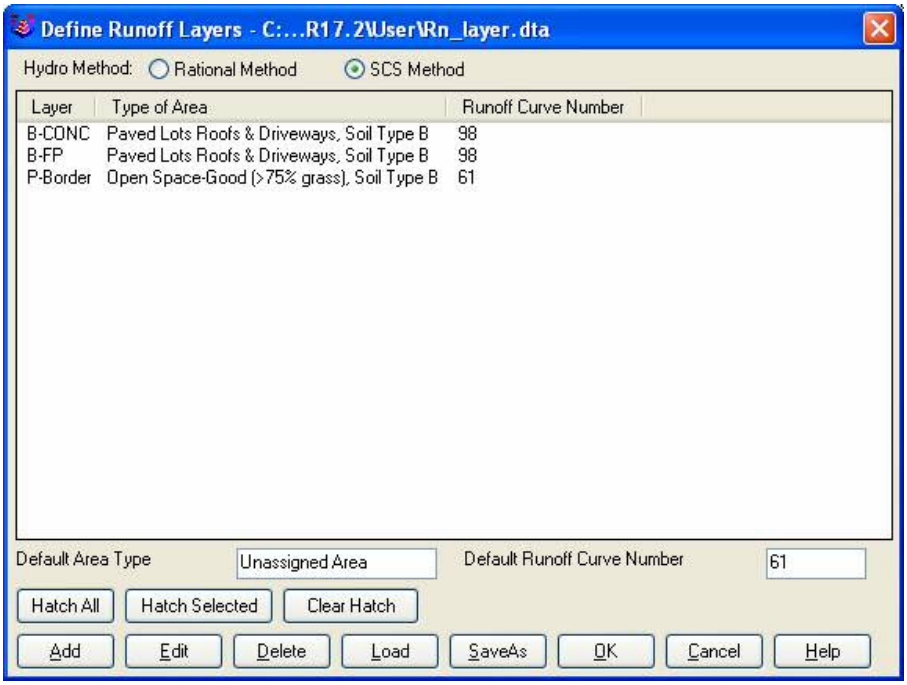
Notice the 7.5 value in the TC dialog to the right.

This was the value if I SELECT FLOW LINE FROM SCREEN and pick the path that the dialog on the left generates.

Can I generate a report of how the time to inlet was calculated?

Maybe there can be a button next to the Time to inlet to select TR-55

Maybe Mannings coefficients can also be put into the WATERSHED->DEFINE RUNOFF LAYERS to be used for this calc as the flow path passes through each polyline area the same way Carlson already calculates the composite CN.



Will any of this matter if we get HydroCAD and link it to Carlson?

Just food for thought.

Thank You,

David Farina

Senior Designer

I forwarded David's question onto Bruce Carlson, President of Carlson Software, and Dave Carlson, Director of Programming, and received this response from Bruce:

Folks: Excellent input—this will find its way into the next release for sure. We've spent a lot of time studying Haested and matching numbers there on pipe flows in culverts, for example, covering all conditions—but do need to put to bed Time of Concentration for approved defaults and sub-catchment conditions as they vary within a watershed area. This Intellisolve example is really helpful. Also, I took in input at Jennifer's Statesville, NC presentation Dec. 2007 that mentioned the new 100' default and also mentioned:

Using Q=CIA, there are new "rules" being published that

*using larger pipes or it may be larger drainage areas, there is an added multiplier in the form Q=CIA*Q1 where Q1 is a table of values. I didn't get the full details, but we need to research this.*

And in storm sewer design, if we are compositing the calc of time to inlet using a "short-form" SCS-style method, based on percentage area of various land uses and associated runoff coefficients, we need to have a Report button that documents the results for full vetting and reporting out by users, and we need to incorporate an additional auto-calculated, long-form TR55 time of concentration there as well that uses sheet flow, channel flow and shallow concentrated flow. One key in all this is to be able to auto-distinguish these flow types from the DTM and land uses and have the forms filled out with default values, which the user can change.

Question I'm curious about. Say you built a gentle 6'wide, 1% slope swale with 6:1 side slopes, hardly noticeable, mowable, between lots in a subdivision. Would the flow in that be treated as shallow concentrated flow or channel flow? When would one condition end and another

begin, by definition, so we can get real precise on auto-calculating these using layers/land use types and DTM values?

Good stuff, and it will get done.

Bruce Carlson, PE

Pres., Carlson Software

David added the following:

I think when to use channel flow should be determined by the width of the bottom of the channel and hence how deep the channel gets on an 2yr storm 24 storm.

You could have a channel with 1:1 side slopes but if the bottom was 50’ wide and the flow path started in the channel then

the first 100’ would still be sheet flow in my book. Unless of course a huge amount of water was entering the channel from another basin.

I think the concentrated and channel flow times (being in

the fraction of a minute range) are so small and have such a small impact on overall time

compared to sheet flow (fraction of an hour) that you could pick an arbitrary number like 5’ wide bottom and smaller is channel flow and not upset the model.

Sheet flow probably makes up 80 to 90 % of overall TC if it is over grass.

Anyone disagree?

Thank You

Dave Carlson sent this on March 11, 2009

Hi David,

Here’s an update to the Tc by TR-55 routine that allows unlimited number of breakouts. This update is for Carlson 2009 on Acad 2007-09. To install, unzip and copy the arx to

the Carlson2009LSP folder. Let me know if you need a different version or have more suggestions.

For the Storm Sewer Network routine, I put it on the to-do list to add a Select button next to the Tc to show the components that make up the Tc like the Select button does for CN. Also we will looks at adding Manning's n to the Define Runoff Layers for use with Tc calcs.

Thanks for the input.

Dave

Originally posted on **Carlson Connection** by Jennifer Dibona

---

BIM this, BIM that… What is

BIM?

October 21, 2013

Q: What is BIM? And, exactly how does it relate to the civil engineering industry?

A: BIM, by definition, has nothing to do with civil engineering.

BIM stands for “Building Information Modeling”. The term “BIM” originated in the Architectural world and, generally, defines the process of inputting information to and extracting information from a 3D model of a building/facility.

Definition of BIM from the National BIM Standard:

> *BIM is best thought of as “a digital representation of physical and functional characteristics of a facility…and a shared knowledge resource for information about a facility forming a reliable basis for decisions during its life-cycle; defined as existing from earliest conception to demolition.”*

From the National Institute of Building Sciences:

> *Building Information Modeling (BIM) refers to the use of the concepts and practices of open and interoperable information exchanges, emerging technologies, new business structures and influencing the re-engineering of processes in ways that dramatically reduce multiple forms of waste in the building industry. The National BIM Standard, a key element of the overall industry transformation being supported and coordinated by the buildingSMART alliance™, establishes standard definitions for building information exchanges to support critical business decisions. Implemented in software, the consensus-based standard will form a basis for more accurate and efficient commerce within the capital facilities industry. The National BIM Standard is also intended to help participants in facilities-related processes achieve more reliable outcomes from commercial agreements.*

From Geomatics International:

> *A Building Information Model (BIM) is a digital representation of physical and functional characteristics*

> *of a building. Construction and management of buildings involves many stakeholders, so that proper sharing of information over the entire lifecycle of a building is very important. The Open Geospatial Consortium (OGC) is developing BIM standards that promote efficient web-based information sharing in the Architectural, Engineering, Construction and building Ownership and Operation (AECOO) markets.*

Because Wikipedia is open-source and able to be edited by anyone and everyone, the entry for BIM changes regularly. The entire entry looked like this as of February 26, 2009. Here is an excerpt:

> *Building Information Modeling (BIM) is the process of generating and managing building data during its life cycle[1]. Typically it uses three-dimensional, real-time, dynamic building modeling software to increase productivity in building design and construction.[2] The process produces the Building Information Model (also abbreviated BIM), which encompasses building geometry, spatial relationships, geographic information, and quantities and properties of building components.*

That CAD Girl

A lot of confusion is now occurring because Autodesk and their civil resellers are trying to make the connection between BIM and Civil or, more specifically, Civil 3D. See examples here:

BIM for Civil Engineers by Sanjay Asnani, Autodesk
If link doesn't work, find this document HERE.

What Does BIM Mean for Civil Engineers? by Adam Strafaci, Autodesk

Civil 3D and BIM… How do they relate? by Melanie Santer, US CAD

However, if you simply Google **"bim building information modeling"** and look at the first two pages of returns, the only entries that attempt to connect BIM and civil engineering belong to Autodesk or one of their civil resellers. All other hits refer to BIM in an architectural/building sense. If there is a specific software program mentioned, it is Autodesk's Revit product. A caveat to this is the civil/structural engineering specialty field of bridge construction which can also be modeled using Revit.

Bridge construction is a bit of a hybrid in that it is similar to building design and can also legitimately be related to BIM.

Among Autodesk's architectural team and resellers, most, if not all, references to BIM are solely in an architectural/building capacity. See examples here (pages were cached on 2/26/09):

Brave New BIM

The World According to BIM – Part 1

Summit AEC – Autodesk BIM & CAD Software

As you can see from the above links, it is technically incorrect to connect BIM and Civil. However, many in the civil world are witnessing the Autodesk definition of BIM take hold. So, in the event you are ever asked or required to "BIM" a civil project, you are essentially being asked to design and deliver a dynamic, 3d model of the entire project.

It is important to realize that creating a dynamic 3d model for a Civil project (or "BIM"ing a civil project) is not

limited to using a particular software program.

Find a civil engineering design software that allows you to design to specific criteria, is able to show a great visual representation of all the components of your project in 3D view and is able to dynamically reflect changes and you can “BIM” along with the rest of the world.

Designing a project using a dynamic model allows you to design according to specific criteria such as AASHTO (American Association of State Highway and Transportation Officials) standards or by specifying minimum/maximum values for storm or sanitary sewer design. It also is invaluable to detect, before construction, potential conflicts between a proposed network of roads and associated utility networks. As an example, a dynamic 3d model would trigger a warning if, when lowering a roadway, the rule for minimum cover over a pipe on an adjacent roadway has been violated. Also, creating this model allows you to view the model, make changes to vertical alignments and see dynamically updated cut/fill quantities all at once.

To reduce the confusion, it might be time to coin a new term such as “Site Information Modeling” to describe the process

in the Civil industry. But, there is still quite a disparity between the “Information Modeling” done for a Building compared to that done for a Civil project. In true BIM, the “I” (Information) component is as important as the “M” (Modeling) component because determining usability and functionality of the Building through its lifecycle is one of the goals of BIM. At this time, the process on the Civil side is still much more about the “Model” and not nearly so much about the “Information” going into and coming out of the model. When we are able to incorporate results of traffic flow analyses for a roadway or inspection reports showing sludge build-up and flow capacities in sewer/storm pipies and manholes, we will be truly using the “Information” as it was intended in an “Information Model”.

Originally posted on **Carlson Connection** by Jennifer Dibona

---

Top Myths About Carlson Software

October 21, 2013
I'm asked many of these questions on a fairly regular basis and thought it was time to look into some of them and provide the fullest answer I could. Where possible, I've researched and found the answer myself. In a few cases I had to rely on Carlson representatives to supply the answers.

Myth #1 Autodesk stopped working with Carlson in February 2008.

False. In February 2008 Carlson simply stopped being a reseller of Autodesk products.

In other words, if you want to run Carlson on top of AutoCAD, Map, Land Desktop or Civil 3D, you'll have to buy it from an Autodesk reseller instead of from Carlson. Carlson remains part of Autodesk's Developer Network (ADN) and is listed on Autodesk's partner page. The ADN designation provides tools to developers to help build their products on top of Autodesk

products. As a point of comparison, Eagle Point Software is also a development partner of Autodesk.

Myth #2 Carlson is owned by Autodesk or, (“bonus”-myth) Carlson will be sold to another, larger software company.

False. Carlson Software was started in 1983 by Bruce Carlson and remains a private, family-owned business. No one can absolutely guarantee the future, but I have heard Bruce Carlson speak many times about the value he places on competition in the marketplace and his belief that the consolidation of many other software companies has come at the expense of the end-user of the software.

Selling out? I don’t see it. But partnering? Yes. Carlson places a great deal of value on working with any company who wants to work with them. Click on the image below to see the many different programs Carlson imports data from and exports data to.



Myth #3 Because Carlson Software uses basic AutoCAD entities instead of "intelligent objects", it does not have 3D or dynamic abilities.

False. Carlson Software uses basic AutoCAD entities so that all drawings produced by their programs can be easily shared with any other DWG- or DXF-compatible program, regardless of version. Carlson has figured out a way to have the dynamic reactions work on basic entities such as lines, polylines and text. One example would be having profiles and storm drain structures automatically adjust their elevation as a centerline alignment is edited and changed along a surface. And, all of this happens without having to fight the dreaded "proxy objects"!

Myth #4 Because Carlson now works on top of Intellicad, it no longer works on top of AutoCAD-based products.

False. Carlson Software has always worked on top of AutoCAD-

based products and, if you listen to Bruce Carlson discuss the issue, hopes to always continue doing so.

In April 2008, Carlson began giving their customers an IntelliCAD-based “stand-alone” copy of their software with every purchase of Carlson Civil, Survey, Hydrology, GIS, TakeOff and other programs. (IntelliCAD is widely described as an “AutoCAD-clone”. You can read more HERE.). This, again, gives more power and options to Carlson users because it allows the user to choose whether to run Carlson on top of practically any version of AutoCAD, AutoCAD Map, Land Desktop, Civil 3D or on top of IntelliCAD.

Also, with their Sight Survey program (launched in 2008), Carlson created their first program to run on top of MicroStation.

At last year’s 25th Anniversary users’ conference, Bruce Carlson stated that Carlson hopes to have their software working on 4 different platforms within the next few years: IntelliCAD, AutoCAD, Microstation and ESRI.

Myth #5 Carlson doesn’t have CIVIL “BIM”-ability.

First, the premise of the statement is incorrect. BIM (Building Information Modeling), by definition, has no relationship to the civil engineering industry. It is architectural in scope and refers to actual buildings and facilities.

However, for several reasons there has been a push to re-define the term BIM to apply to Civil Engineering (in general) and Civil 3D (in particular). When discussing BIM in the context of Civil Engineering, it simply means that a software program has the ability to:

- design to specific criteria
- show a great visual representation of all the components of your project in 3D view and
- dynamically reflect changes to your project.

Can Carlson Software do all that? Absolutely.

Carlson can, and has been able to, produce true 3D models of civil/survey/utility project sites for years. These models can be viewed in 3D and quantities are dynamically updated whenever the model changes.

Because Carlson has strongly served the U.S. mining industry for over 20 years, they long ago developed features for grading, material quantity calculations and surface viewing and visualization to meet the demands of this industry. In fact, the civil industry pales in comparison to the mining industry in regard to these demands.

Myth #6 Carlson has only been developing civil software since 2007.

False. To make sure I got this right, I asked the folks at Carlson for help and received the following in response:

> *Bruce Carlson began developing his software for the mining industry in 1983. By 1984, the program was able to extract profiles and cross-sections, calculate volumes and design road profiles. 3D Surface viewing abilities have been available in Carlson Software since the early 1990's.*
>
> *Carlson developed the stand-alone Carlson Survey program in 1996 and in 1999 Autodesk contracted to market and sell a version of it called "Autodesk Field Survey". Autodesk did away with Field Survey after a few years and Carlson*

migrated most users over to Carlson Survey where it has grown to become a favorite of surveyors.

Various civil features were organized as modules in a package called SurvCADD that was released in 1989. The civil engineering routines were renamed as Carlson Civil in 2006.

The first Hydrology module for Carlson was released in 1993. It was re-packaged as Carlson Hydrology in 2006.

Carlson Hydrology was the first and, I believe, is still the only H & H software to function entirely within the DWG-environment. If I learn differently after this document is made public, I will post a correction in this space.

Myth #7 Carlson may have found a spot in some surveying firms, but larger firms aren't using it.

False. Again, I requested generic customer data from Carlson and was told that,

> *Among our 30,000+ users, there are many DOT agencies and also ENR Top 50 firms using Carlson Software. Carlson Software is very experienced in working with large firms, due to their mining background. All 20 of the top 20 U.S. coal companies use Carlson Software at some level, most being standardized on the software for mine planning and design.*

As far as my personal experience, I've only been working with Carlson Software for a couple of years and companies I work with tend to have fewer than 25 users. I can personally say that I have seen or know of a few large firms who have moved to or are in the process of moving to Carlson.

These do not include the many customers of mine who have recently let their software contracts lapse, purchased one or more seats of Carlson and have told me they plan to purchase and implement Carlson when the economy rebounds.

Myth #8 Carlson Software does not support the full project lifecycle – Concept to Completion.

False. I think Carlson probably has the project lifecycle covered better than any other software firm in existence.

Carlson Software has data collection, survey processing, civil design, hydrology, GIS, construction material takeoff and machine control software in their stable.

Myth #9 Carlson Software doesn't have the support system in place to adequately support its users.

False. Carlson provides free technical support directly out of their Maysville, KY and Boston, MA offices. Again, I have heard Bruce Carlson say that keeping tech support free and in-house ensures that their software will remain easy-to-use and that the company will always be responsive to the wishes of their customers.

If a bug or other problem with the software is encountered and logged into Carlson's tech support department, the corrected files will be emailed to you as soon as the programmers develop the fix. Periodically a collection of the updated files will be released to all users as a maintenance

patch. These updates are available to all users whether or not they are under a maintenance contract with Carlson.

I received this testimonial from a customer on March 13, 2009.

> *"Recently I found that the Time of Concentration input boxes were inadequate under the hydrology portion of Carlson Civil Suite so I emailed a description of the problem to them. I was very impressed to get a phone call the same day. They discussed the problem with me and had a revised program update to me in under a week. I've been emailing Autodesk for over a year on problems with Civil 3D and never heard a peep. Needless to say I'm very happy with the customer service I have received from Carlson thus far."*
>
> *David Farina, CCAD Engineering*
> *– Greenville, SC*

Other examples of Carlson's responsiveness:

Example 1: The ability of the Carlson Civil & Hydrology "Design Bench Pond" command to have multiple interior benches

was added to the software after an attendee at a workshop I held in Raleigh, NC in December 2007 requested it.

Example 2: In the LotNet command, the prompts asking users to specify minimum and maximum building offset distances for lot layout generated too many tech support calls. In the next release, the prompts were re-worded to make the intent more clear.

Example 3: The LotNet command now allows you to designate “sub-areas” (such as wetlands, stream buffers, poor soils, etc.) to be excluded from your area to be subdivided during the lot layout routine. This request came from a prospect during a demonstration in Raleigh.

Example 4: I understand that Carlson’s tech support team was bombarded by requests to change the default cul-de-sac location from the “Start” of the road to the “End” of the road in the RoadNet command. This was changed in the 2009 release.

Example 5: The ability to draw multiple building pads inside lots during the lot layout routine in LotNet was requested by a firm out of Savannah, GA.

Myth #10 Carlson Software can't share data with Land Desktop or Civil 3D.

False. Carlson has many tools in their software to import civil/survey data from and export data to Land Desktop and Civil 3D. It can be said that Carlson Software works with Civil 3D data as well as Land Desktop or any other civil/survey software and also works with Land Desktop data as well as Civil 3D or any other software.

Carlson has LandXML import and export functionality, can directly convert Land Desktop points and contours into Carlson points and contours and also imports a Civil 3D surface as elevated contours.

Regardless of the civil/survey software being used, LandXML is the best mechanism to import/export a surface model because it maintains the TIN lines of the surface.

Myth #11 To be continued.

That CAD Girl

If anyone thinks of other question(s) they'd like to supply, please email me HERE. I'm open to suggestions and don't mind expanding beyond 10 Myths.

Originally posted on **Carlson Connection** by Jennifer Dibona