Updates at Carlson Software

You've been busy so have we!

PEM
Moving Kentucky Forward

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UK Department of Mining Engineering
KSPE/Professional Engineers in Mining
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Things we have been working on

- Hardware
- Renishaw Acquisition
- Carlson Photo Capture
- Slope Stability Monitoring System
- Data Collection
- Machine Control
- Office Software
- Training & Support

How’s Carlson Software doing?

- 2017 was our best year
- Acquired part of Renishaw
- Up to 140 employees
- Added employees in India, Australia, England, Canada, and the US
- Obtained a military contract
- Expanded product offerings

Carlson Is All About Getting The Job Done

Survey Office: Dynamic tools for COGO, Adjustments, Points, Deeds, Contouring and more Continue ->

OFFICE PRODUCTS

Carlson iCAD
Carlson Civil
Carlson Hydrology
Carlson GIS
Carlson Survey
Civil Suite
P3D Topo
P3D Hydro
P3D Drill and Blast
Carlson Connect
SurveyGNSS
Carlson SurvNET
Carlson Point Cloud
Carlson Underground Mining
Carlson Surface Mining
Carlson Geology
Carlson Takeoff
Carlson Construction
Carlson GeoTech
Carlson Trench
Carlson CADnet
Simplicity 'Sight' Survey
CSI Office
Carlson AgStar
Carlson 3DX Viewer
IntelliCAD Engine

DATA COLLECTION

SurvCE
SurvPC
Grade Supervisor
Carlson Field
CSI Mobile

OFFICE SOLUTIONS

Find what you need

Civil Design
Hydrology
GIS in the Office
Takeoff / Data Prep
Survey Office
Post-Processing
Point Cloud
Mining Design & Planning
Reclamation
GIS Mapping
Accident Reconstruction
Agricultural Software
3D Culvert Design

CARLSON SOFTWARE

Training, Contacts & More

Carlson's Top 10
Training
Contact Info
News
30-Day Demos
Informational Videos

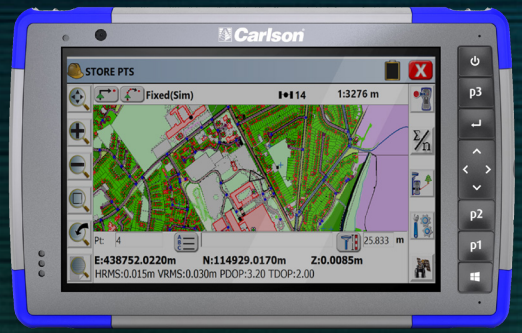
Changes that have happened in the last 18 months at Carlson Software

- BRX6 GPS
- Combined Robotic/GPS Surveying method – Hybrid Surveying
- GPS Equipment Guidance on a Block Model
- Partnership with a Photogrammetry Company – Carlson Photo Capture
- Acquisition of a portion of Renishaw
- US Army Surveying Data Collector
- Carlson Command Machine Control Software
- Integration of Surface Mining Cut/Haul Cycle Analysis/Fill
- P3D Hydro/Topo/Blast Design
- Point Cloud/Drone Data
- Open Pit Optimization
- We are up to 418 Youtube Training Videos (all free)
- We just completed our strongest year!
- Added Carlson Photo Capture
- Adding Slope Stability monitoring program

Hardware

Surveying hardware, software and methods are changing

Hardware



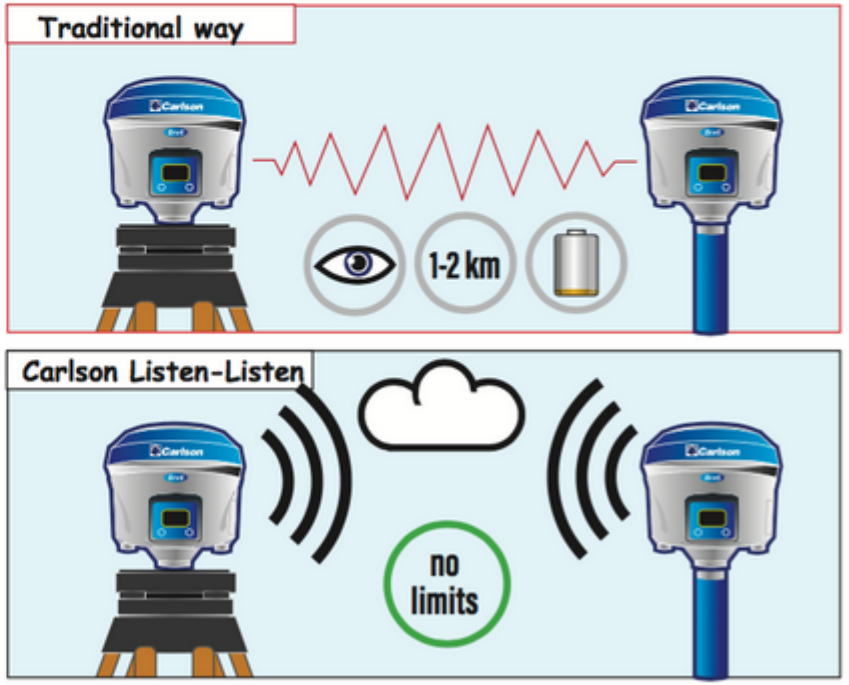
Total Station – CR2+ and CR5+
GPS – BRx6
Tablet – RT3
Carlson Surveyor 2
Carlson Mini2 Data Collector

New GPS Receiver and ways to use it!

Carlson Listen-Listen

About Carlson Listen-Listen and Carlson's RTK Network:

- Carlson Listen-Listen and Carlson RTK Network are unique cloud based low latency services
- They are available to Carlson SurvCE/PC customers using Carlson's BRx6 GNSS receiver as a base station
- They are hosted through Amazon Web Services for unlimited processing power, speed and bandwidth
- The system eliminates base line length restrictions encountered when using UHF radios
- Carlson Listen-Listen supports single base with multiple simultaneous rover connections
- Carlson RTK Network processing is optimized to compensate for inter-frequency biases when using GLONASS



KEY FEATURES

- Athena™ GNSS RTK engine
- Integrated UHF radio
- Integrated GSM Modem
- Base or Rover functionality
- Tilt Sensor
- Integrated Bluetooth & Wi-Fi
- 4 GB Internal memory + microSD card to 64 GB
- IP67 Enclosure

Robotic Total Station on Steroids

Renishaw Acquisition in 2017

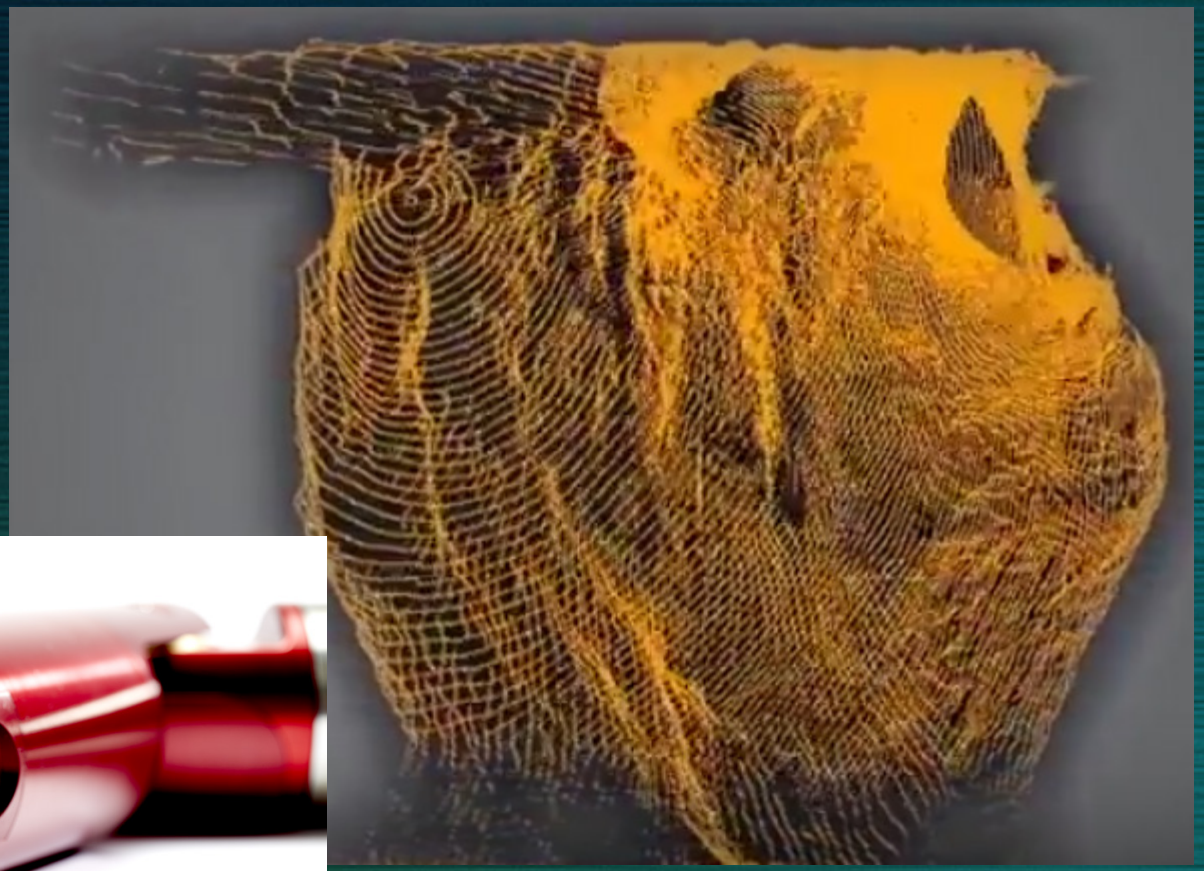
Renishaw Acquisition

Acquired a hardware manufacturer UK-Based York, England

Mining Hardware, Marine, and Modules Products

- Carlson Void Scanner
- Carlson Cabled Boretrak
- Carlson Rodded Boretrak
- Carlson C-ALS
- Carlson Quarryman Pro
- Carlson ILM – Industrial Laser Modules
- Carlson Merlin

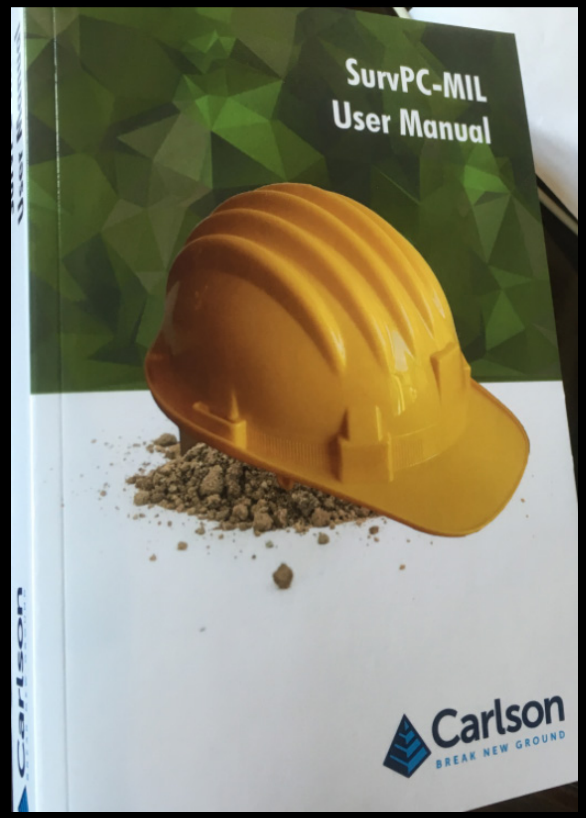
Carlson LMD CALS Void Scanner



Data Collection

We now supply the Army with surveying data collection software for their surveying needs

SurvPC - MIL



- Sorry I can't go into any additional details. It's classified……

There is a new Web Site dedicated to Data Collection http://survce.com/home

Developed GNSS (static GPS processing software)

Upgraded SurvCE

Upgraded SurvPC

Upgraded Field

Upgraded CSI

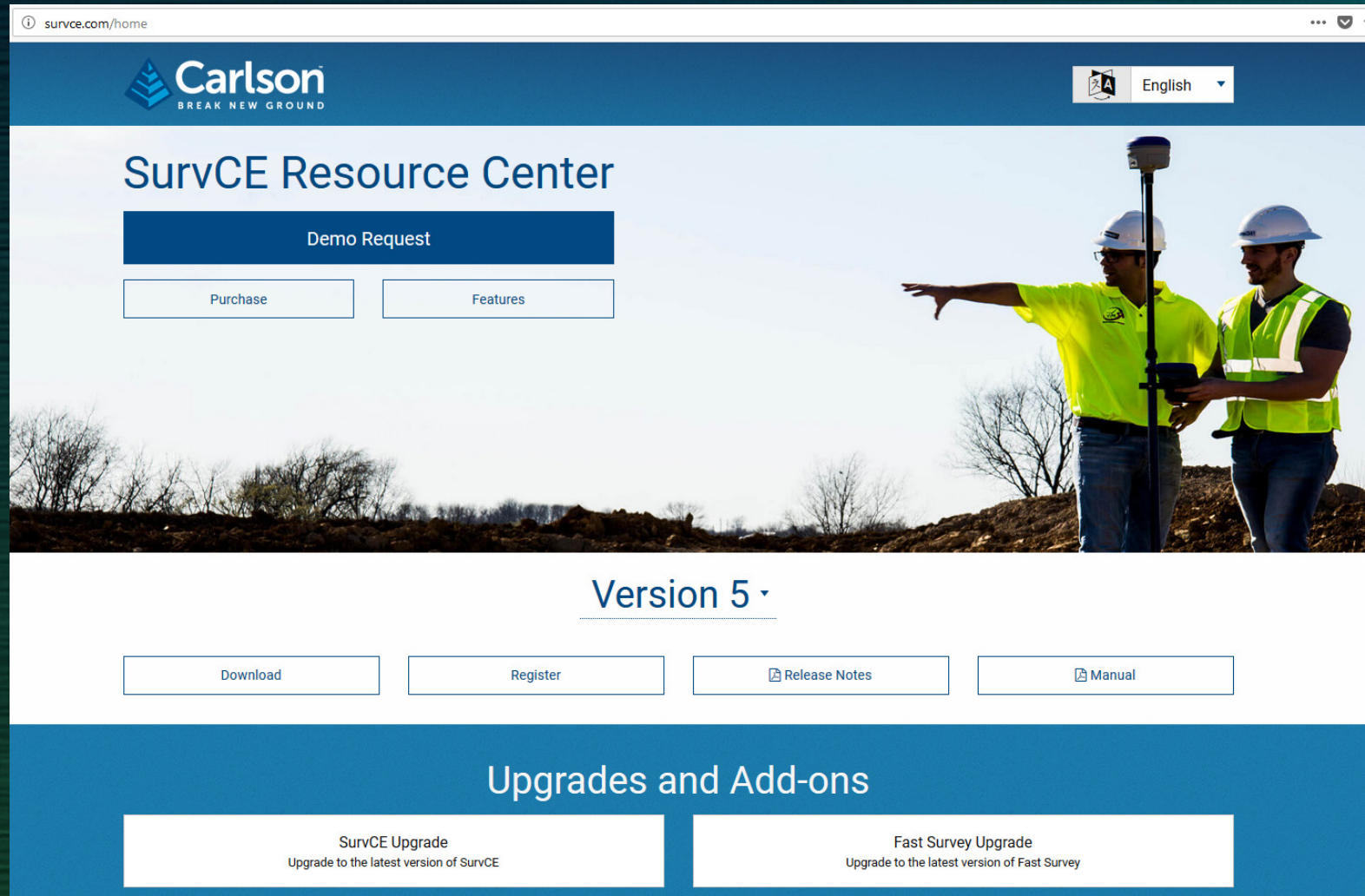
Grade Supervisor

Fast Survey

Listen – Listen

Carlson X-Port

We will develop software to drive the Renishaw equipment

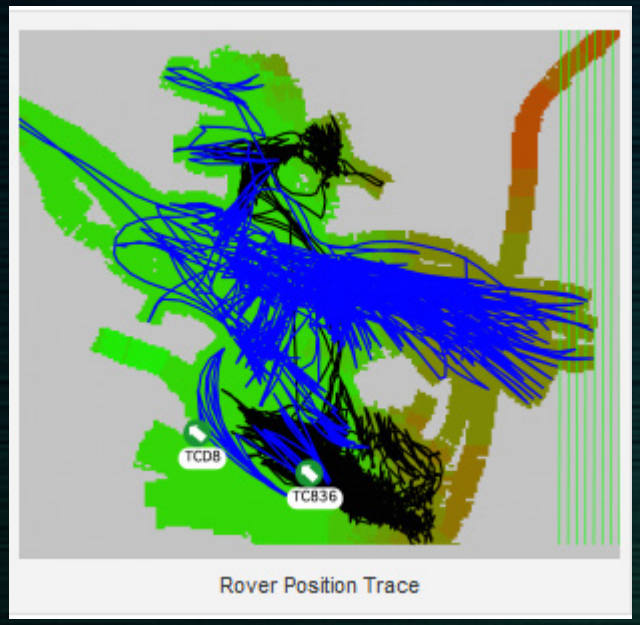


Machine Control

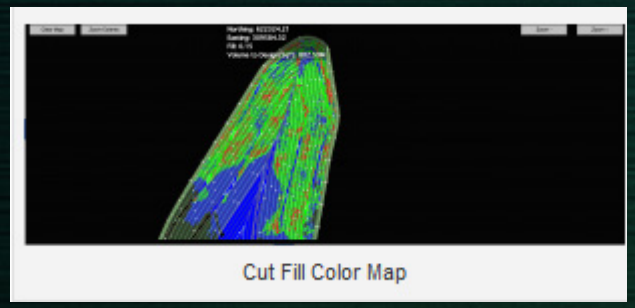
New software developments for machine control

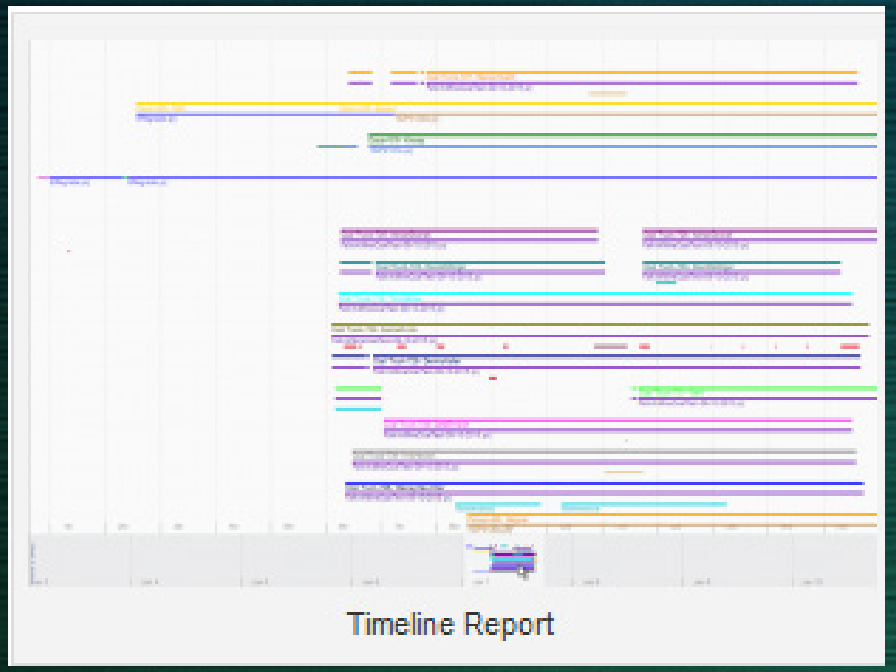
Carlson Command (Subscription –based)
Drill Guidance with Blasthole layout
Blast Commander (coming in 2019)
Machine control on a block model

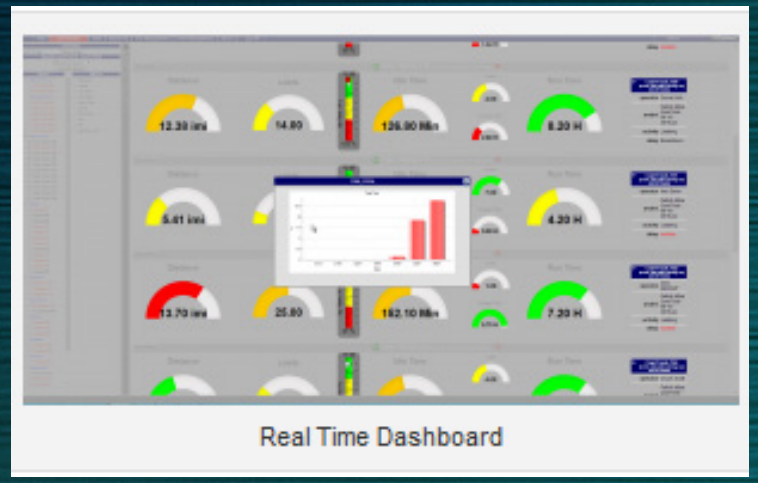
Command Features

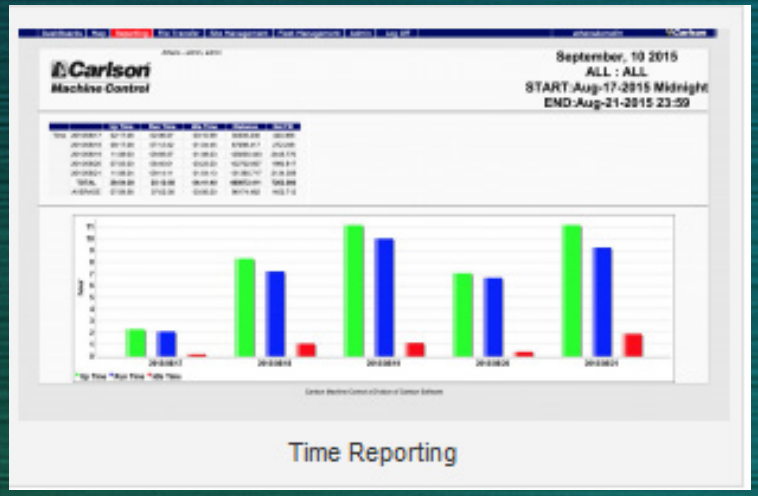


Rover Position Trace


Cut Fill Color Map


Timeline Report

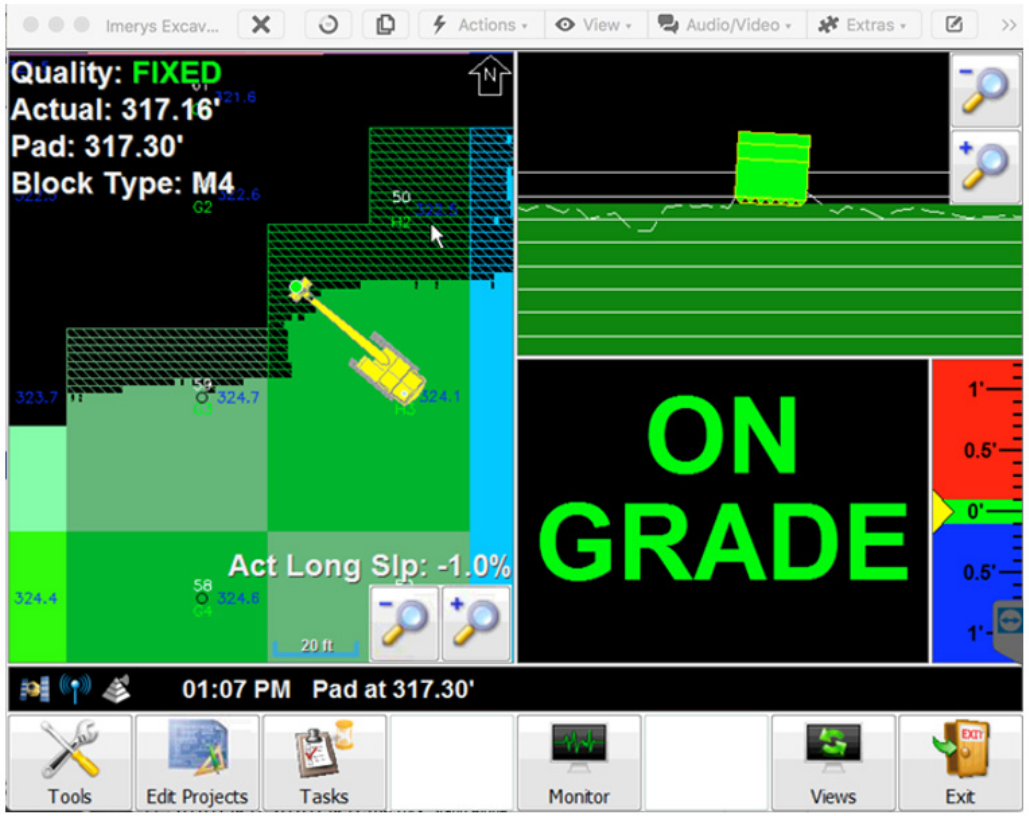

Real Time Dashboard



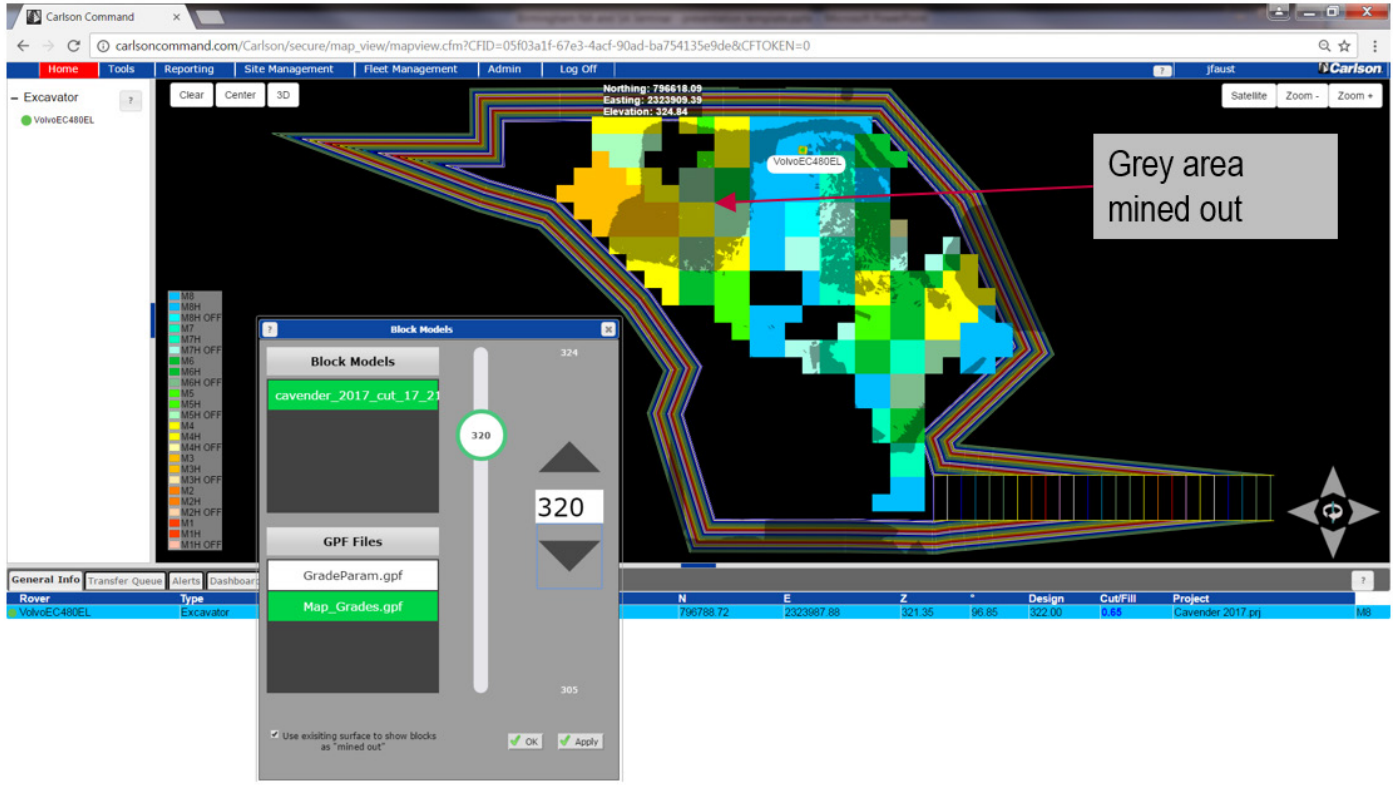
Time Reporting

GPS Machine Guidance on a Block Model

Deployment – What the Operator sees



Deployment – What the Office sees

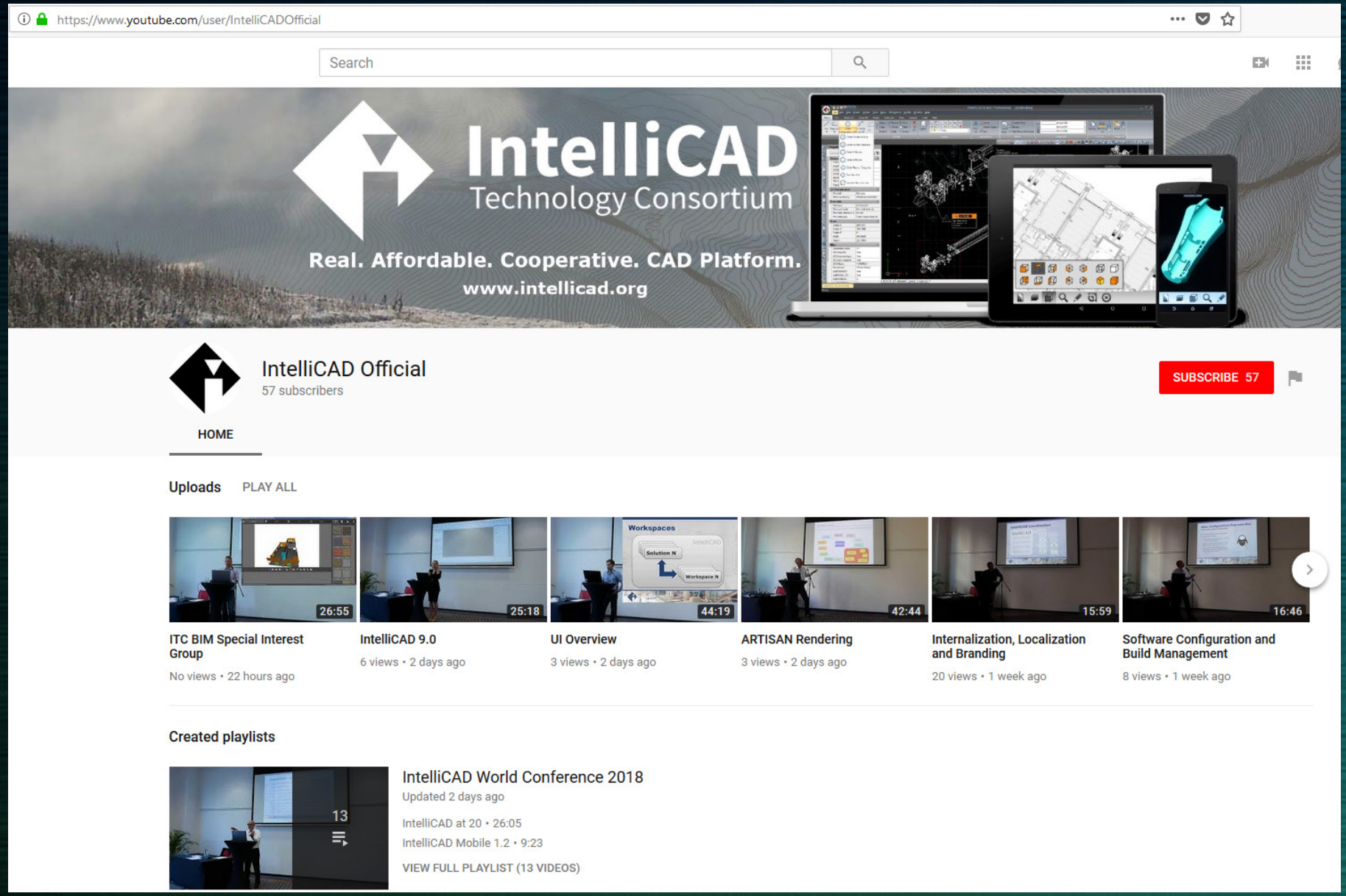


Carlson MC-8

Carlson Machine Control's Newest Control Box

Office Software

IntelliCAD 9.0 has arrived

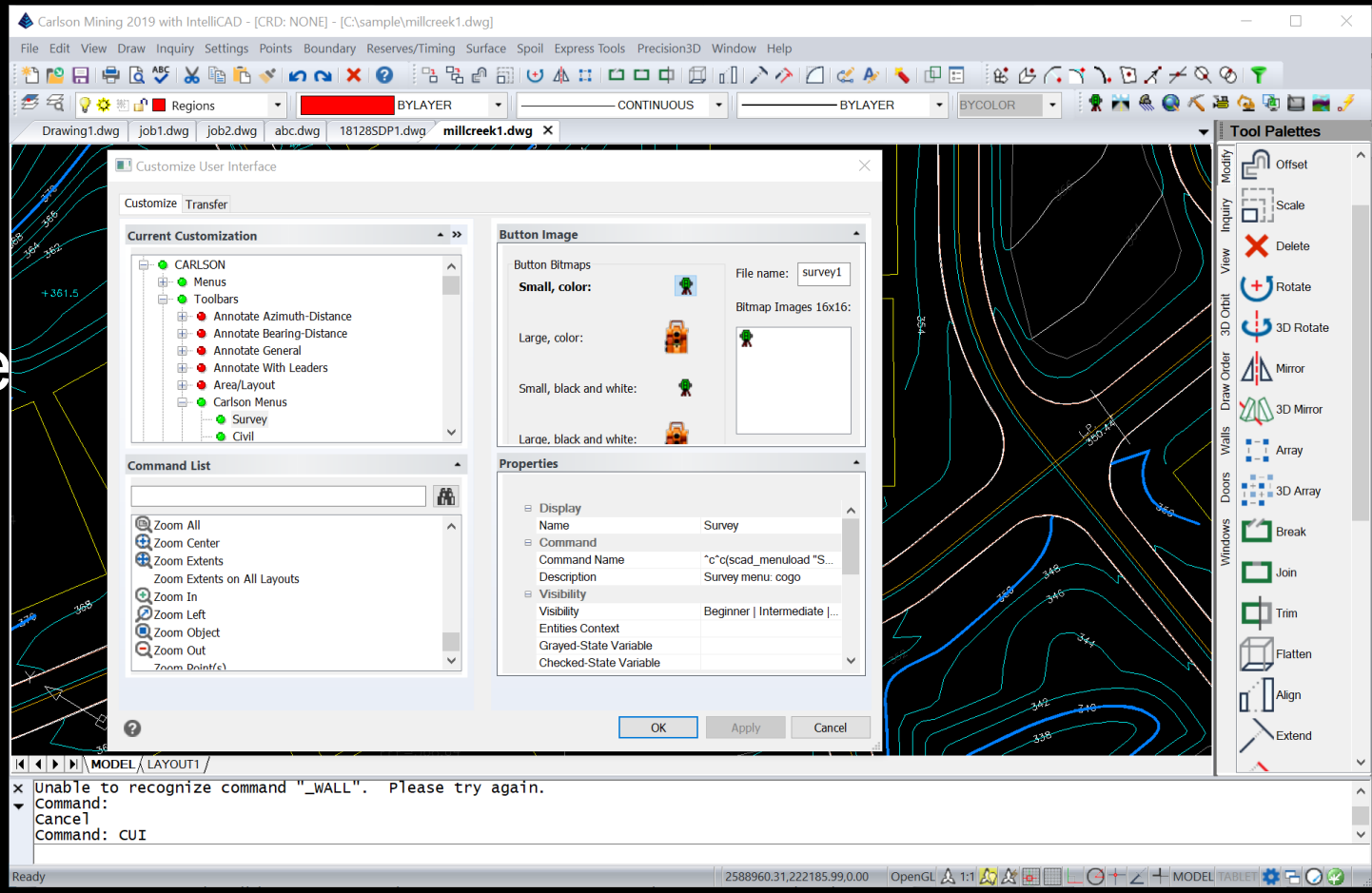


It's free with Carlson Softare

- AutoCAD 2019-2010
- IntelliCAD 9.0 for Win64
- 200+ New Features

Carlson 2019 with IntelliCAD 9.0

- User-Interface:
  - Customize User Interface
  - Tool Palettes
- New commands:3D Solids, Te Explode to Polylines, CLine, Express Tools
- 2018 .DWG File
- Work directly with .DGN drawings
- IntelliCAD YouTube channel

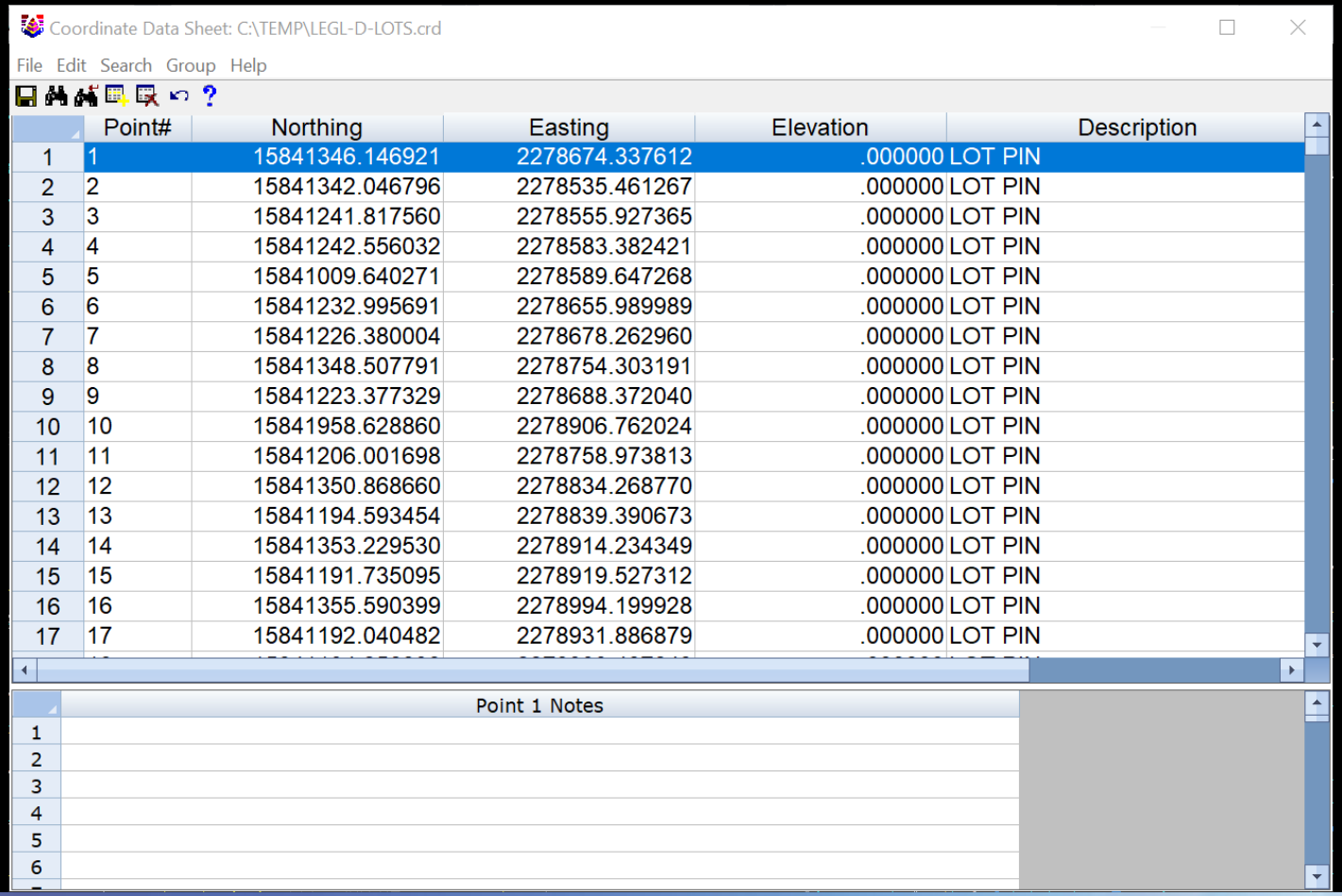


carlsonsw.com

Carlson

Ultra High Resolution Display

- Improved support for font and image scaling for 4k monitors

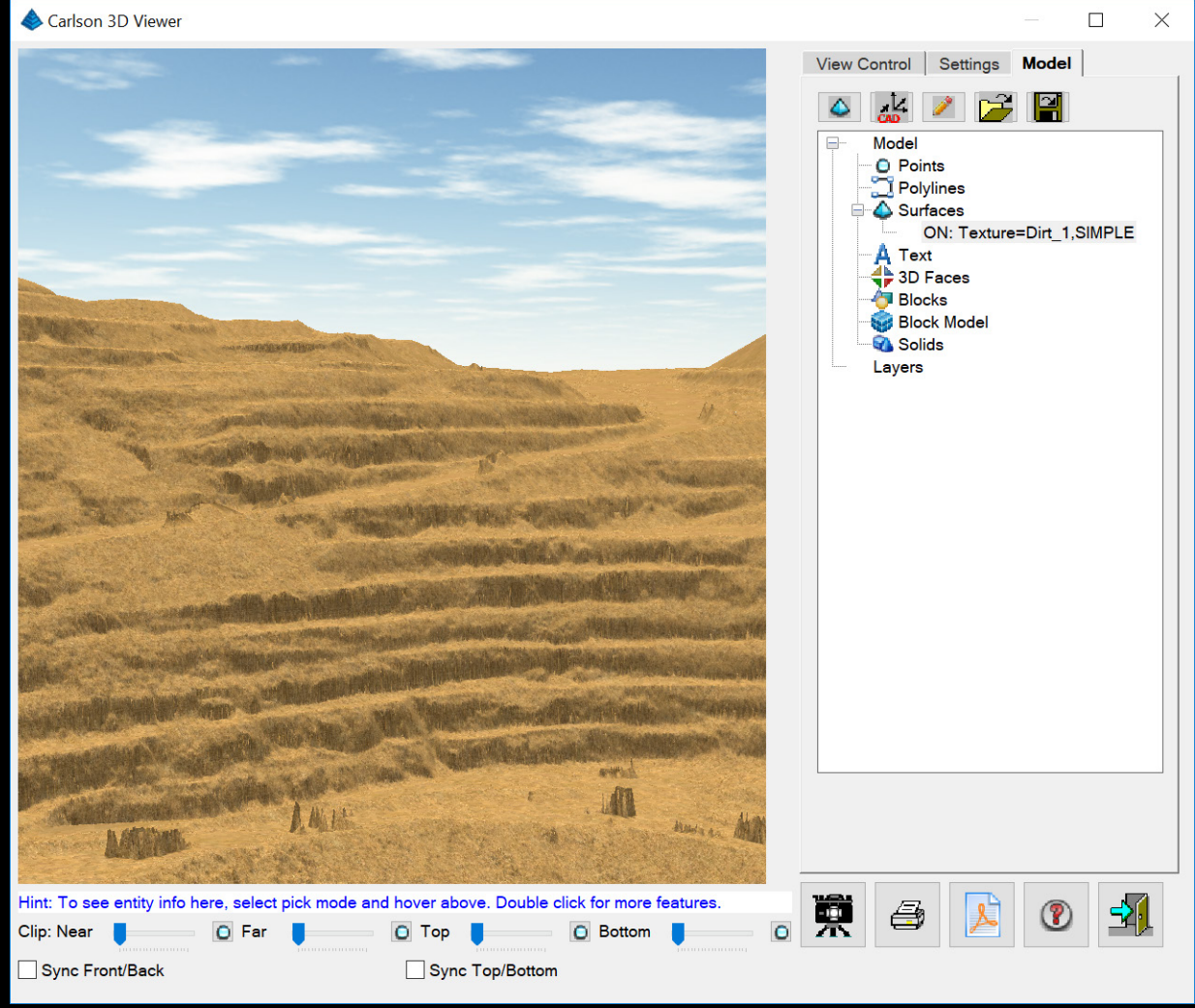


	Point#	Northing	Easting	Elevation	Description
1	1	15841346.146921	2278674.337612	.000000	LOT PIN
2	2	15841342.046796	2278535.461267	.000000	LOT PIN
3	3	15841241.817560	2278555.927365	.000000	LOT PIN
4	4	15841242.556032	2278583.382421	.000000	LOT PIN
5	5	15841009.640271	2278589.647268	.000000	LOT PIN
6	6	15841232.995691	2278655.989989	.000000	LOT PIN
7	7	15841226.380004	2278678.262960	.000000	LOT PIN
8	8	15841348.507791	2278754.303191	.000000	LOT PIN
9	9	15841223.377329	2278688.372040	.000000	LOT PIN
10	10	15841958.628860	2278906.762024	.000000	LOT PIN
11	11	15841206.001698	2278758.973813	.000000	LOT PIN
12	12	15841350.868660	2278834.268770	.000000	LOT PIN
13	13	15841194.593454	2278839.390673	.000000	LOT PIN
14	14	15841353.229530	2278914.234349	.000000	LOT PIN
15	15	15841191.735095	2278919.527312	.000000	LOT PIN
16	16	15841355.590399	2278994.199928	.000000	LOT PIN
17	17	15841192.040482	2278931.886879	.000000	LOT PIN

	Point 1 Notes
1	
2	
3	
4	
5	
6	

3D Viewers

- Breakthrough performance improvements
- Improved backgrounds
- New features:
  - Set textures by surface slope
  - Color by normals
  - Display surface coordinates and slope
  - Control line thickness
  - 3D Model Library



Survey
2019
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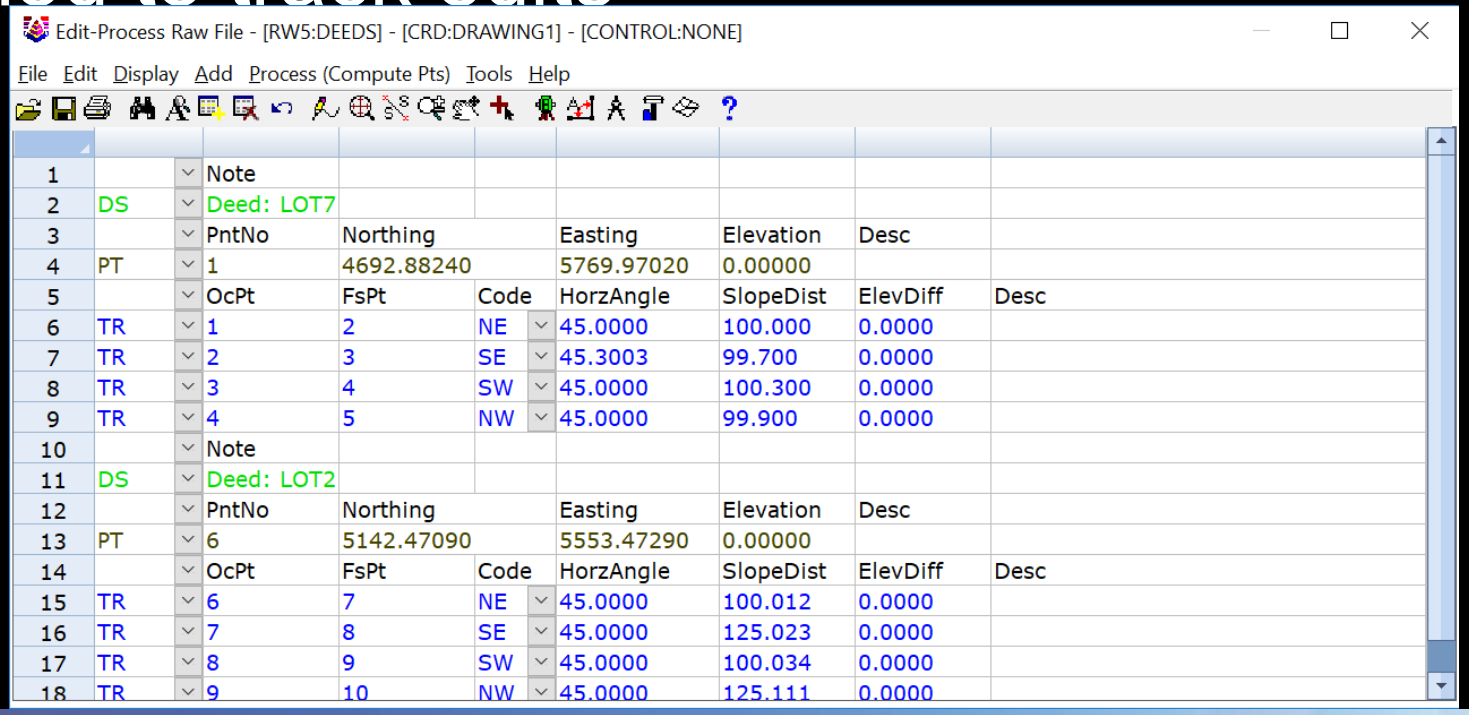
BREAK NEW GROUND

Edit-Process Raw Data

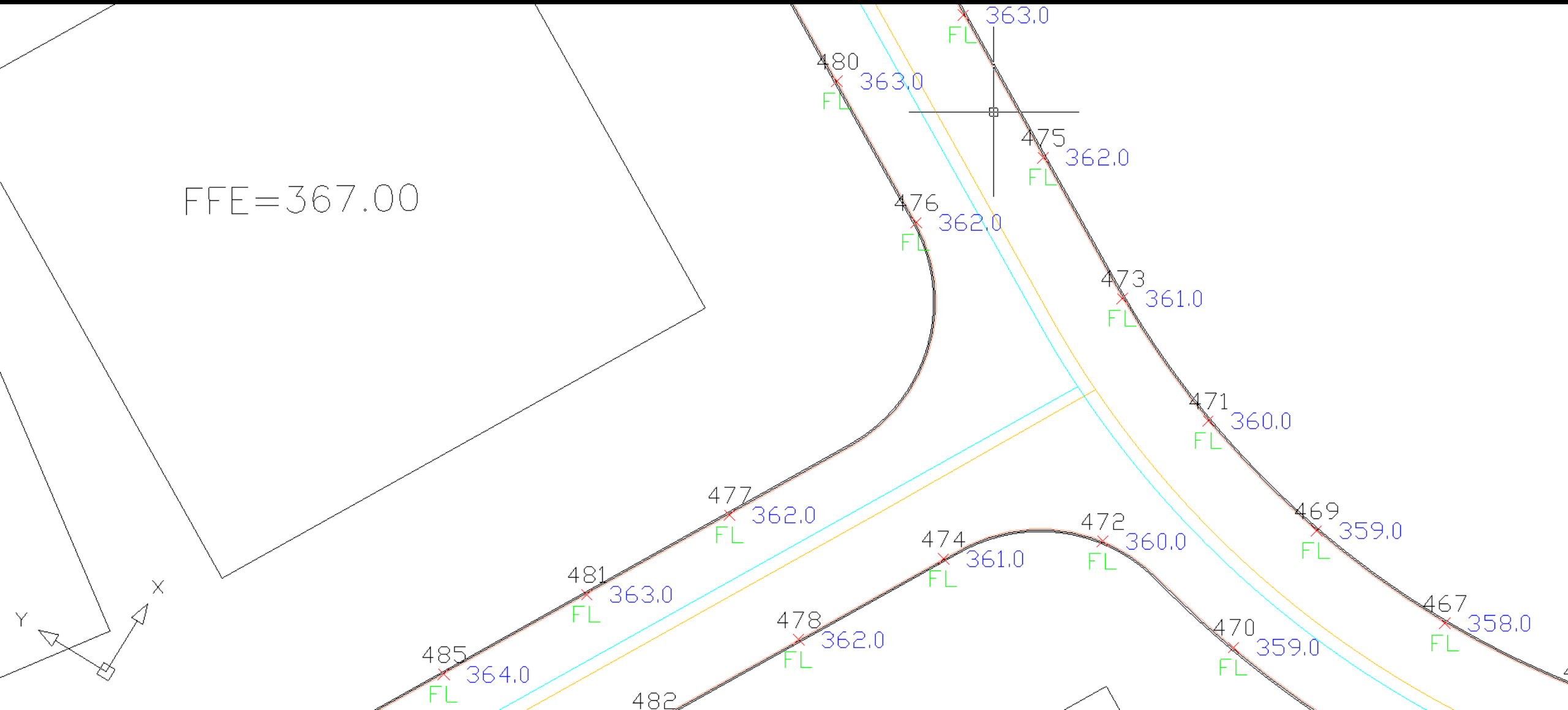
- Added support for processing SurvCE tilt records
- Added scale values function
- Added method to track edits



1		Note						
2	DS	Deed: LOT7						
3		PntNo	Northing		Easting	Elevation	Desc	
4	PT	1	4692.88240		5769.97020	0.00000		
5		OcPt	FsPt	Code	HorzAngle	SlopeDist	ElevDiff	Desc
6	TR	1	2	NE	45.0000	100.000	0.0000	
7	TR	2	3	SE	45.3003	99.700	0.0000	
8	TR	3	4	SW	45.0000	100.300	0.0000	
9	TR	4	5	NW	45.0000	99.900	0.0000	
10		Note						
11	DS	Deed: LOT2						
12		PntNo	Northing		Easting	Elevation	Desc	
13	PT	6	5142.47090		5553.47290	0.00000		
14		OcPt	FsPt	Code	HorzAngle	SlopeDist	ElevDiff	Desc
15	TR	6	7	NE	45.0000	100.012	0.0000	
16	TR	7	8	SE	45.0000	125.023	0.0000	
17	TR	8	9	SW	45.0000	100.034	0.0000	
18	TR	9	10	NW	45.0000	125.111	0.0000	

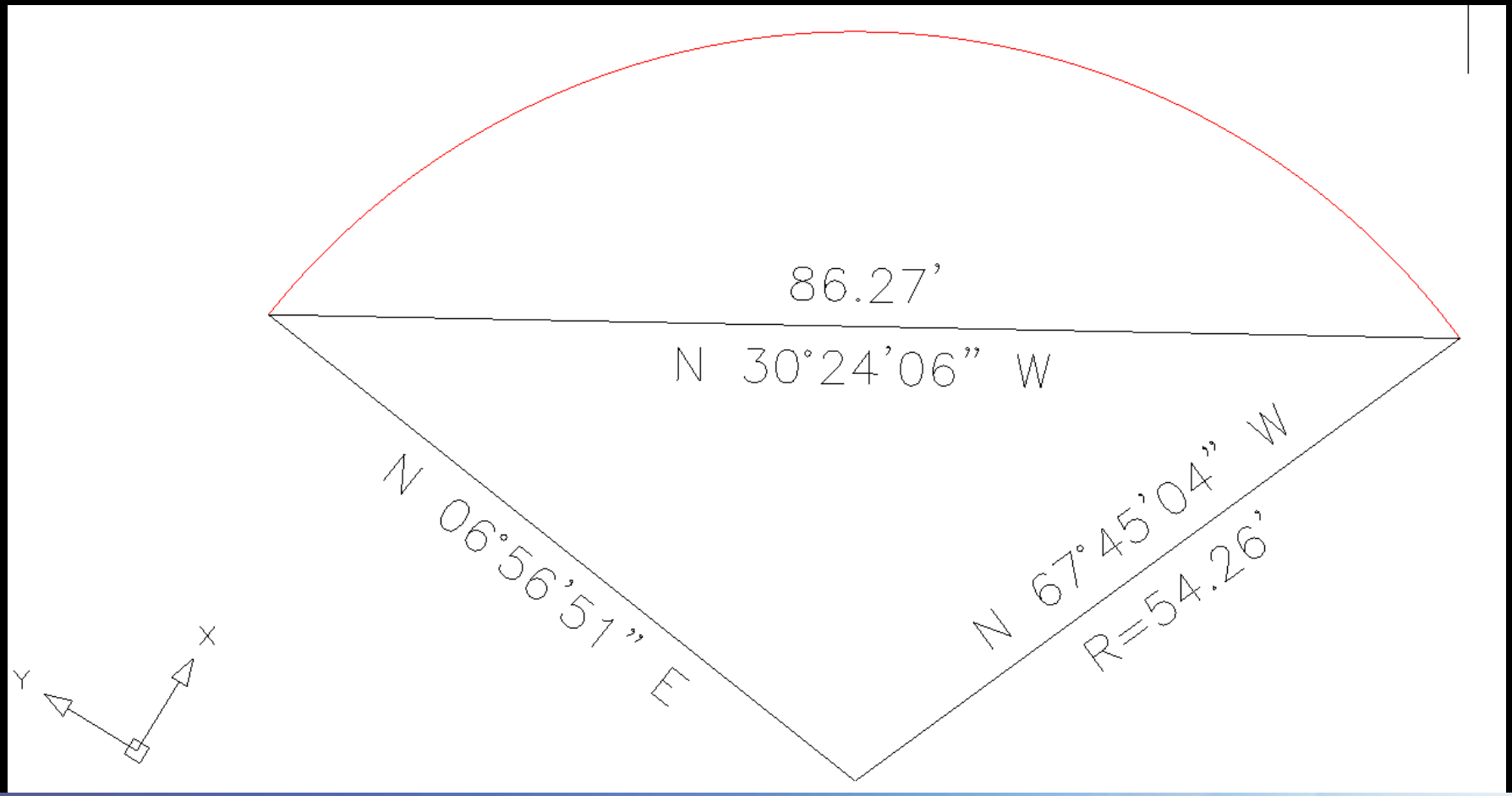
Elevation Along Entity

- Create points at elevations along 3D polyline



Arc Dimensions

- Label arc chord and radial lines



Carlson

Civil 2019

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AUTODESK® Authorized Developer

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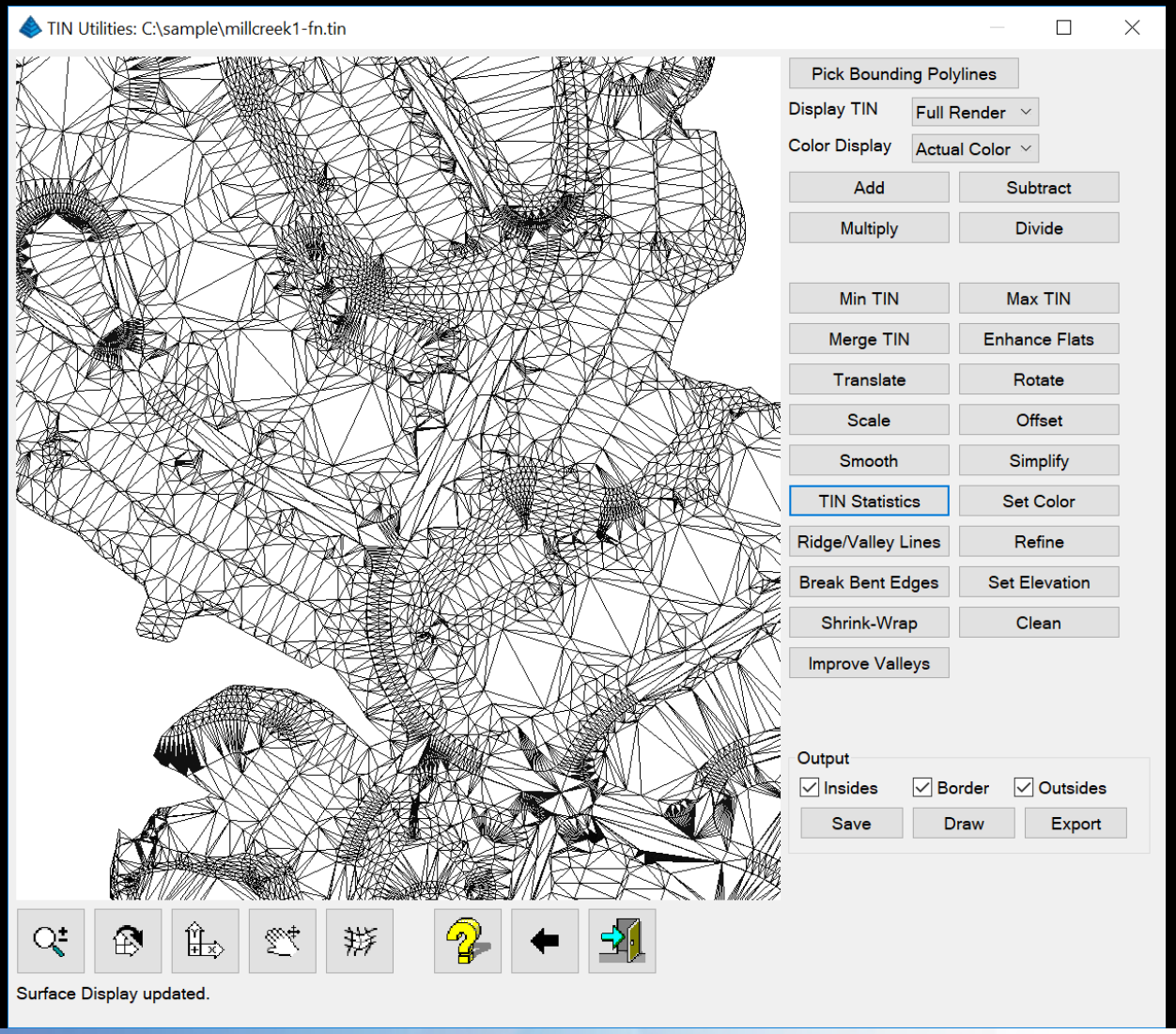
BREAK NEW GROUND

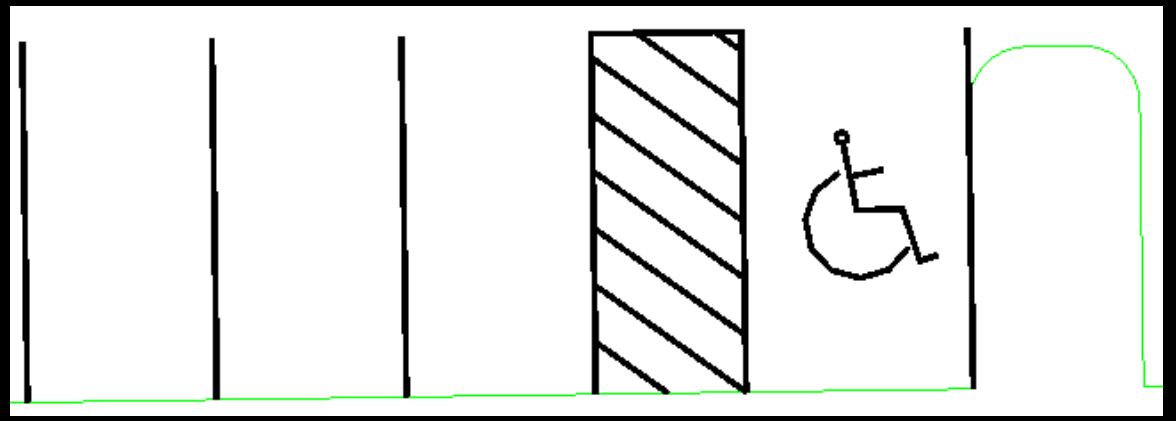
Triangulation File Utilities

- New Simplify method
- New Smooth method
- New Refine function
- New Clean function
- New Enhance Flats function
- New Improve Valleys function



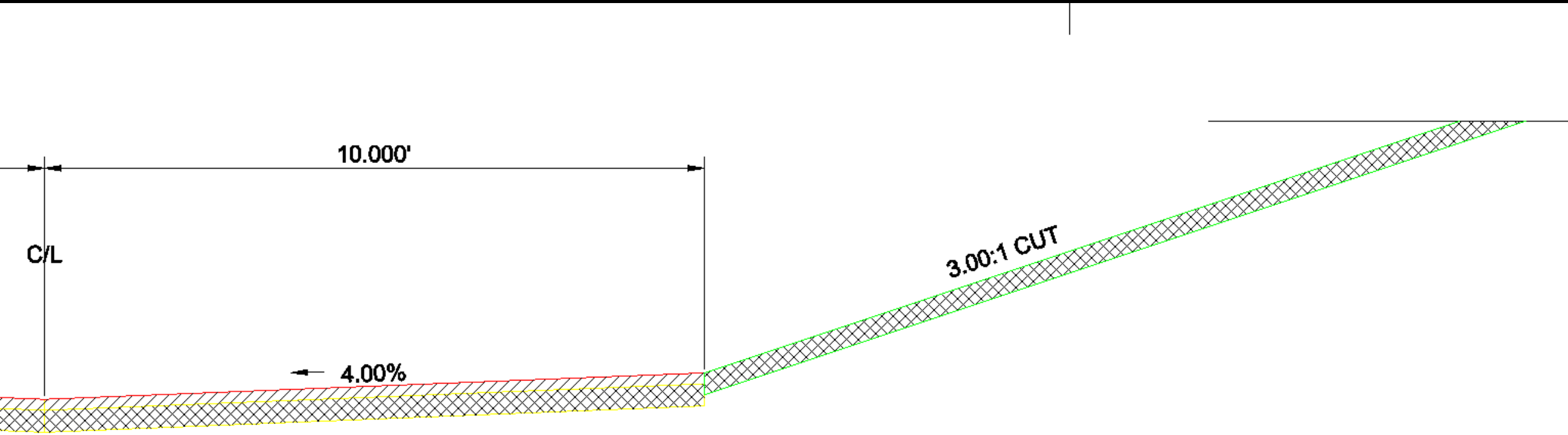
Parking Lines

- Set Line Width
- Draw Baseline
- Handicap Marker
- Buffer Zone
- Picked up by 3D Viewer



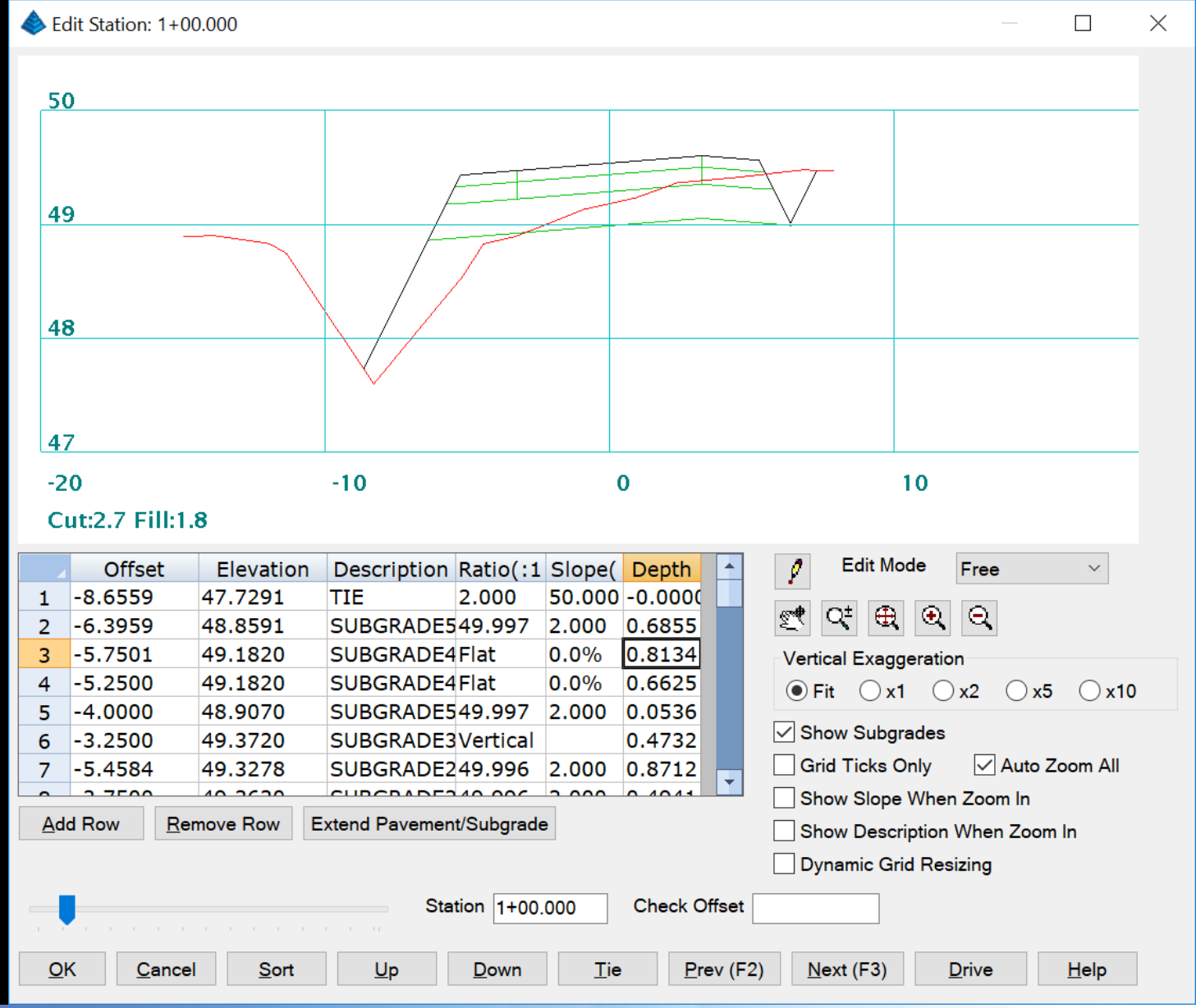
Design Template

- Subgrades in cut/fill grades



Input-Edit Section Files

- Depth display
- Edit elevations by depth



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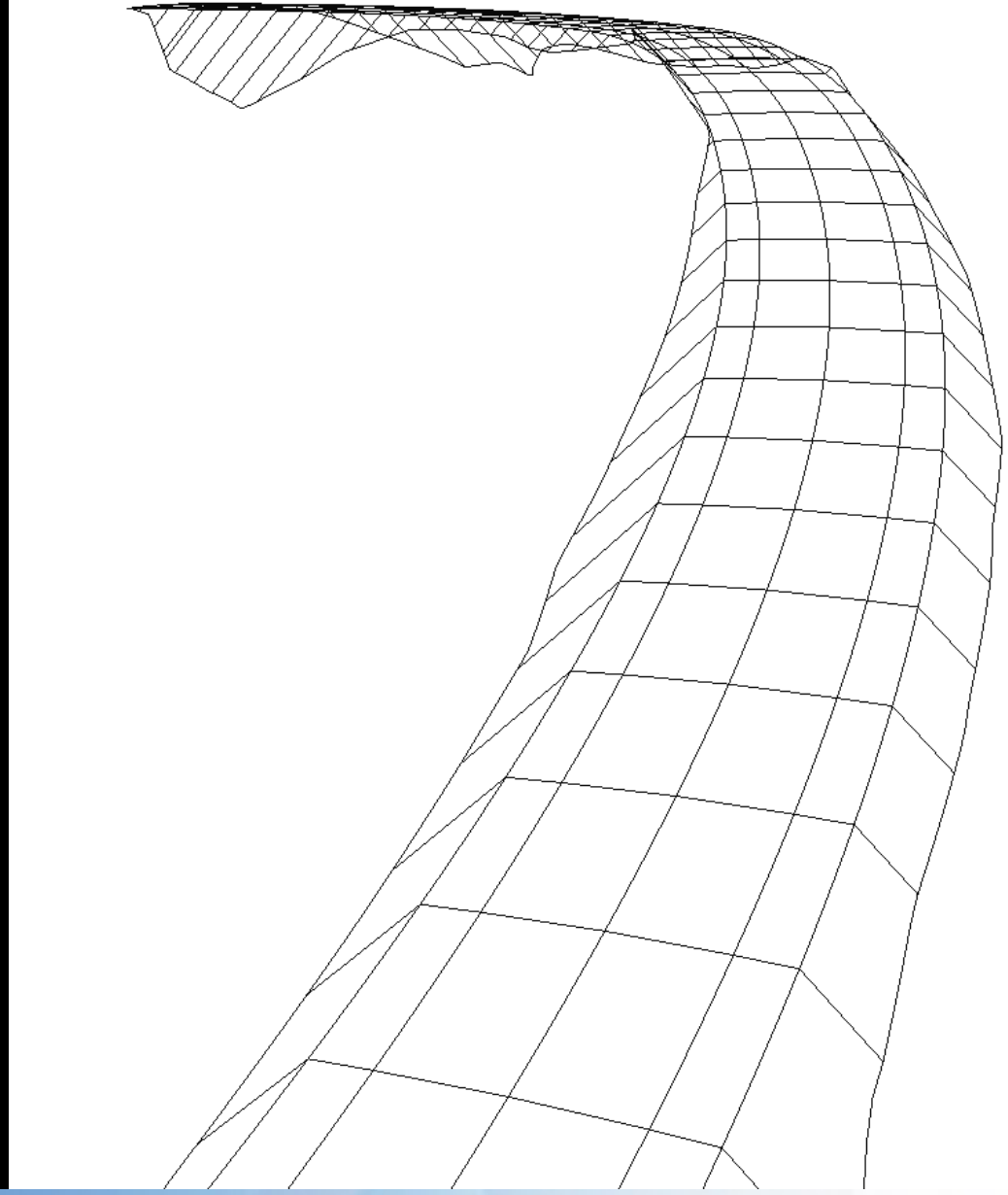
Process Design Sections

- Option to use small station interval
- Option to use Profile



Hydrology
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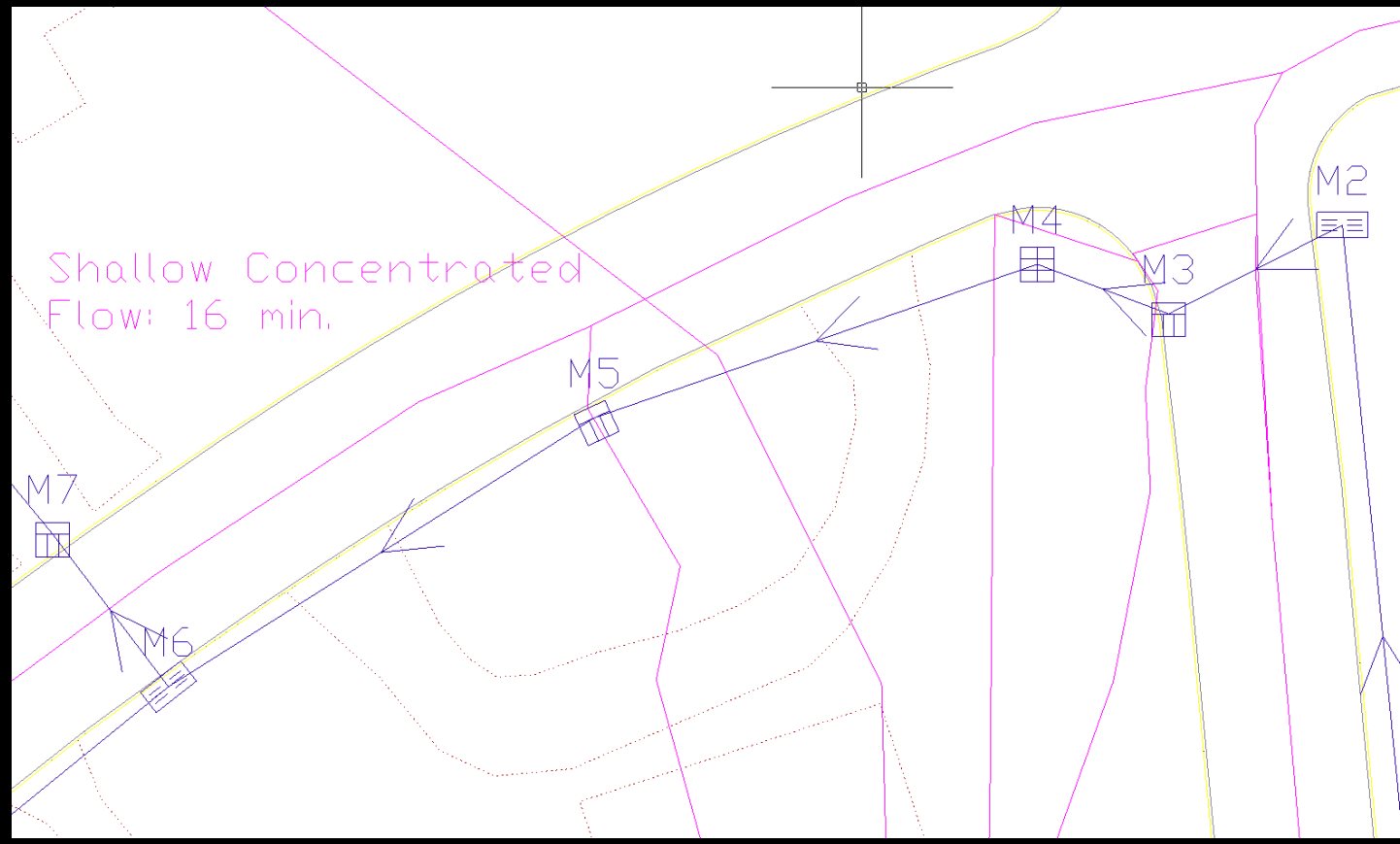
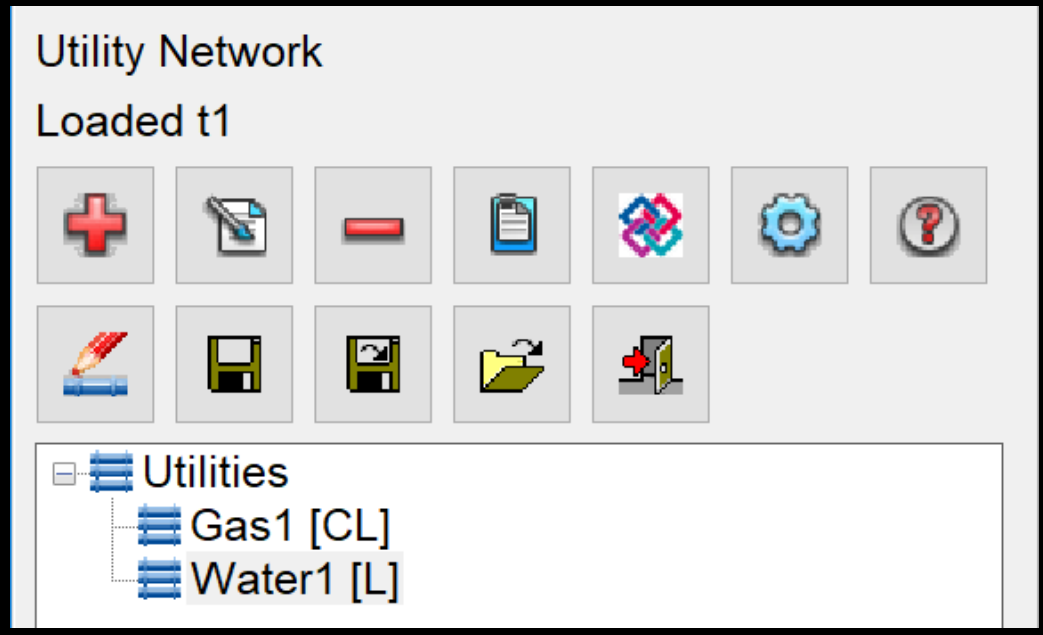
Sewer Network

- More Tc methods
- Add tributary method
- Plan view layer names by pipe material and size
- Label pipe crossings in plan view
- Import/Export model to ESRI



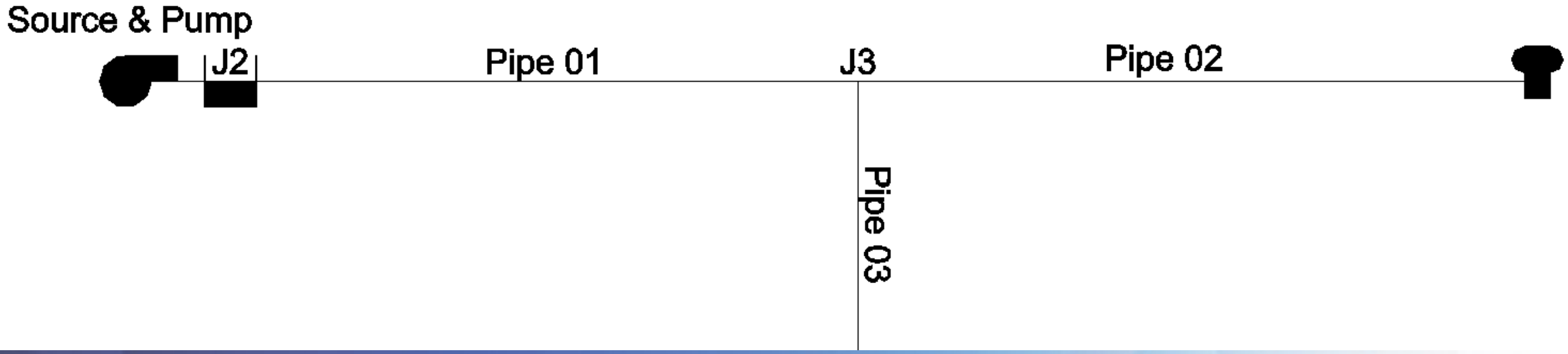
Utility Network

- Draw Profile function with symbols
- Set profile by depth
- Defaults for connection symbols and models
- Plan view label options names



Pressure Pipe Network

- Pipe, pump, valve, tank and reservoir elements
- Create EPANet project file
- Process using EPANet



GIS
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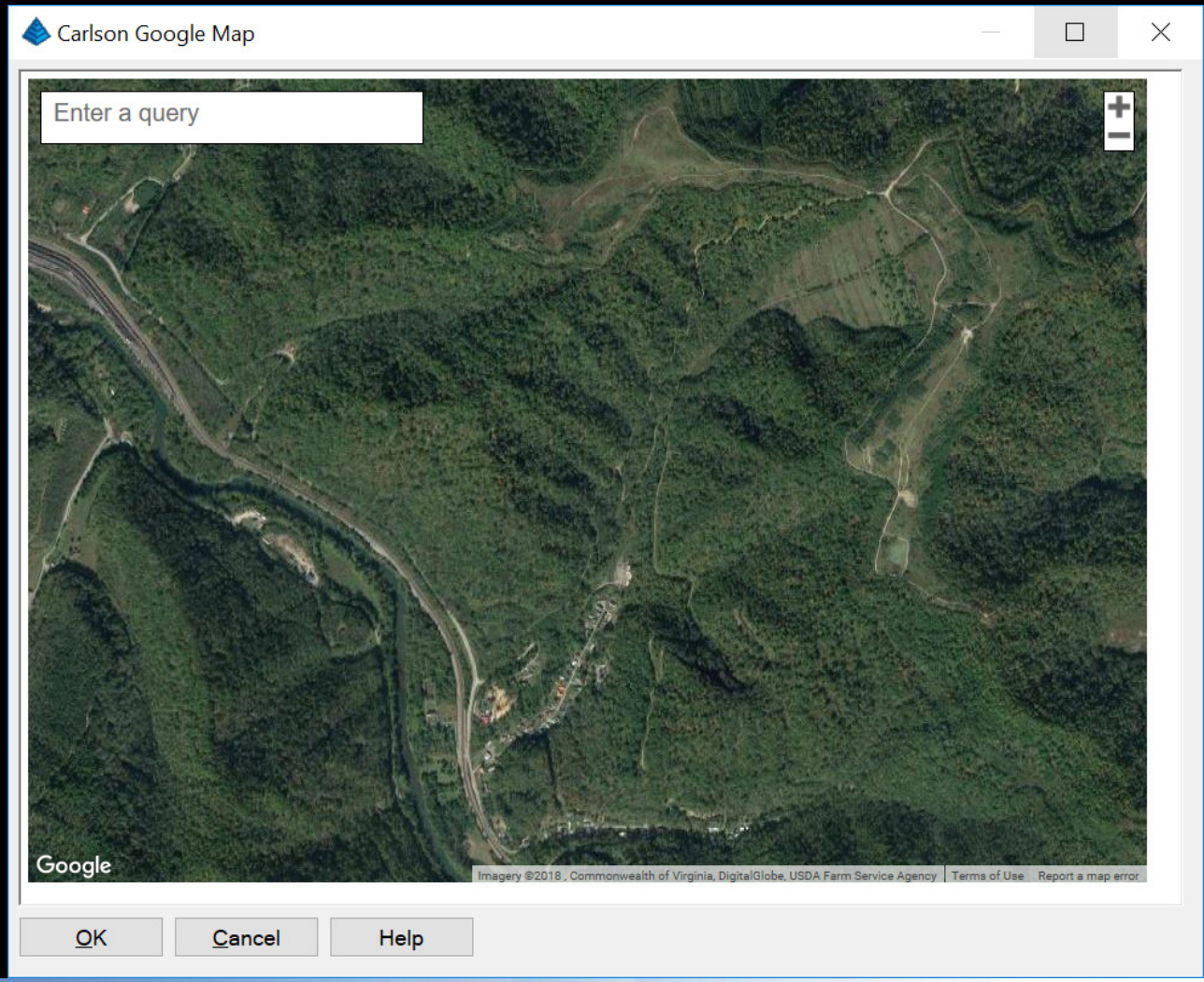
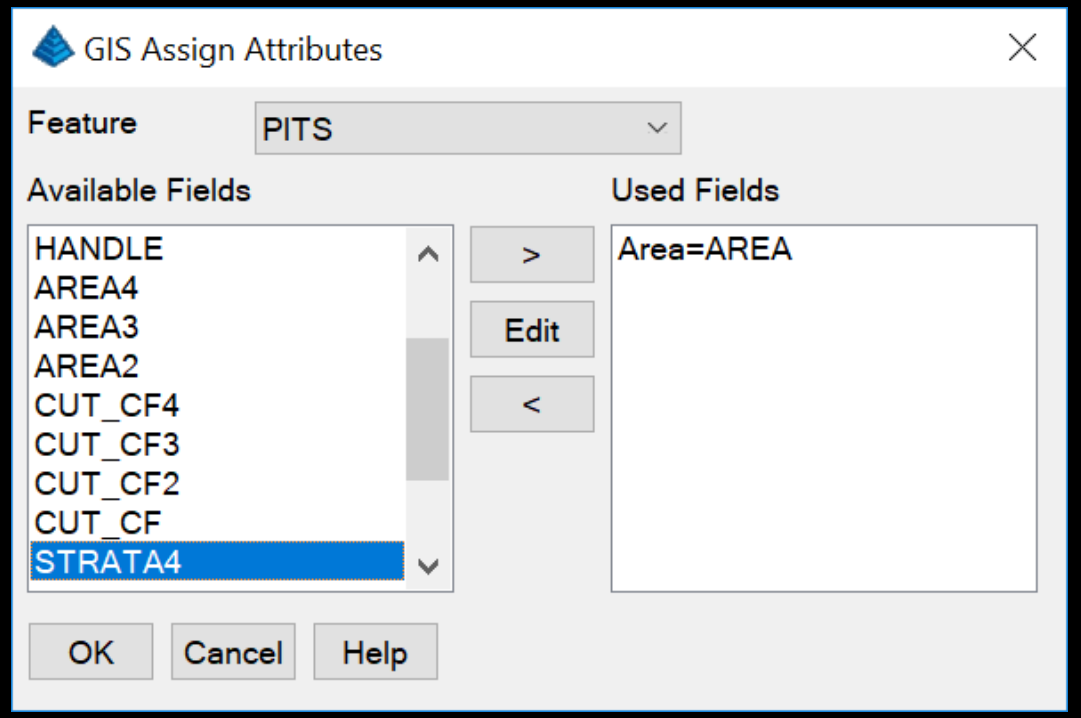
Image By World File

- Support for embedded world file data
- Support for .ECW file format
- Option to scale image



Data Capture > CAD Properties

- Assign CAD properties to GIS attributes
  - Layer
  - Length
  - Area
  - Elevation



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Mining 2019

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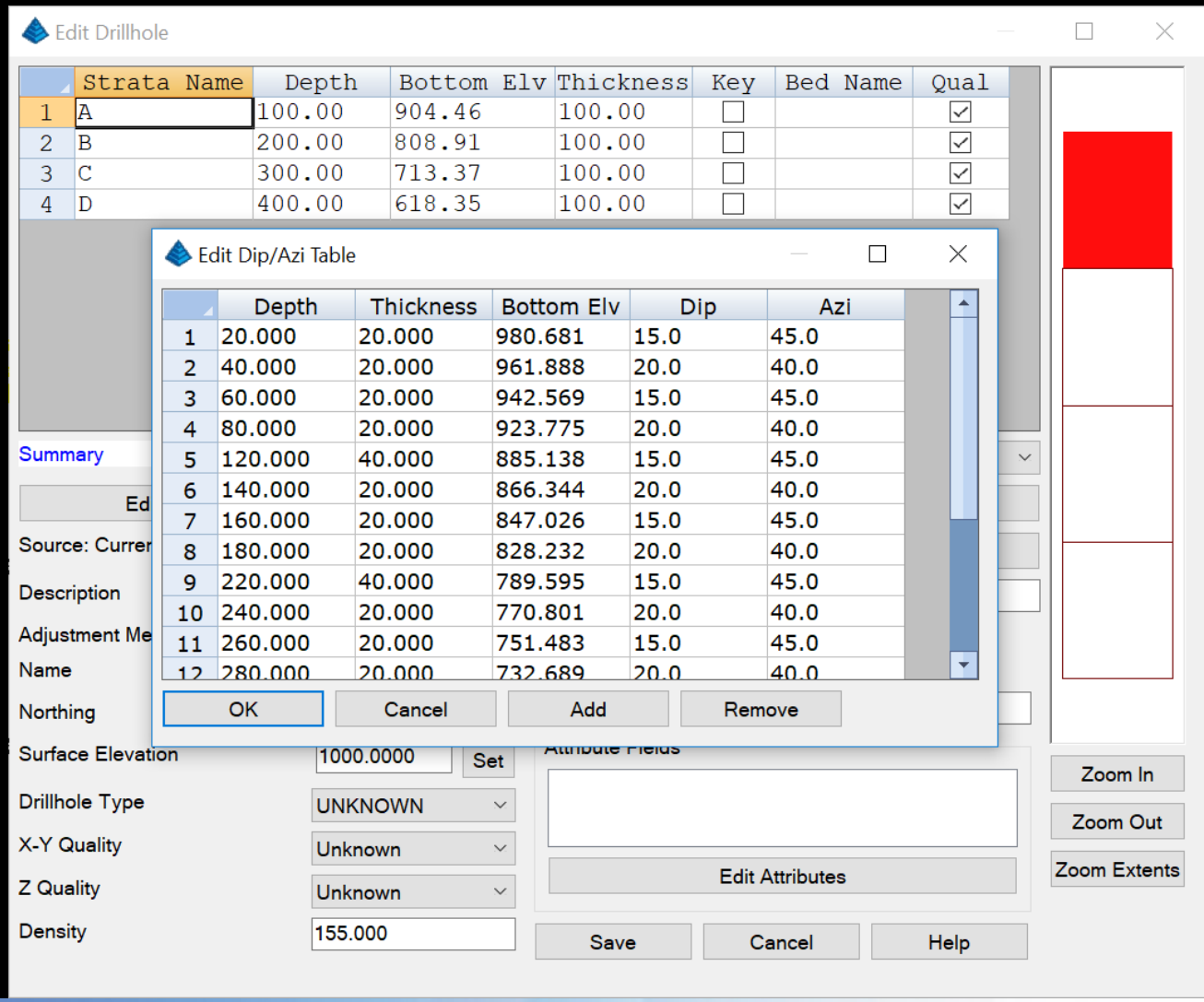
BREAK NEW GROUND

Angled Drillholes

- Method for separate Dip/Azimuth table
- Import Dip/Azimuth from file
- 3D Geologic Columns



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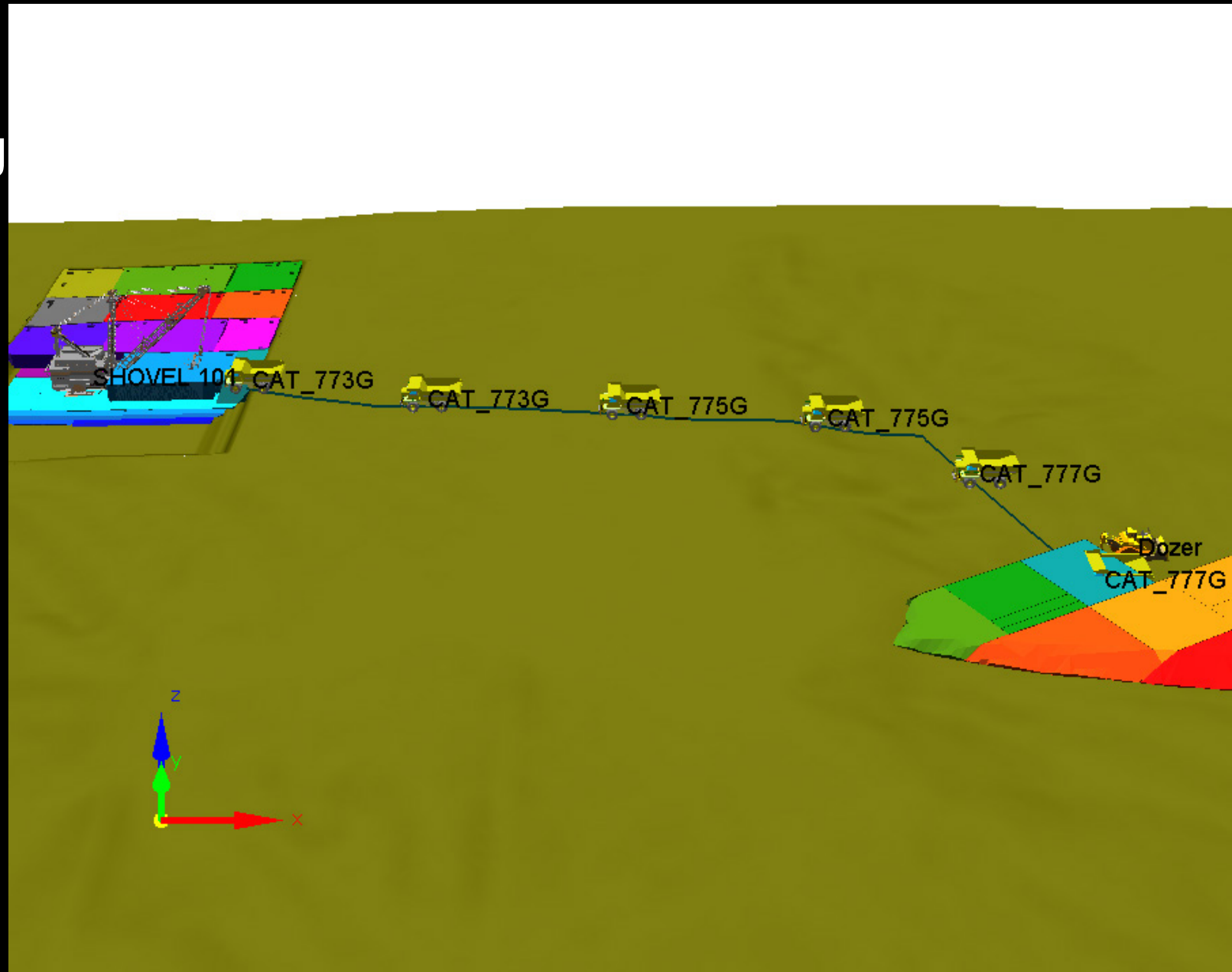
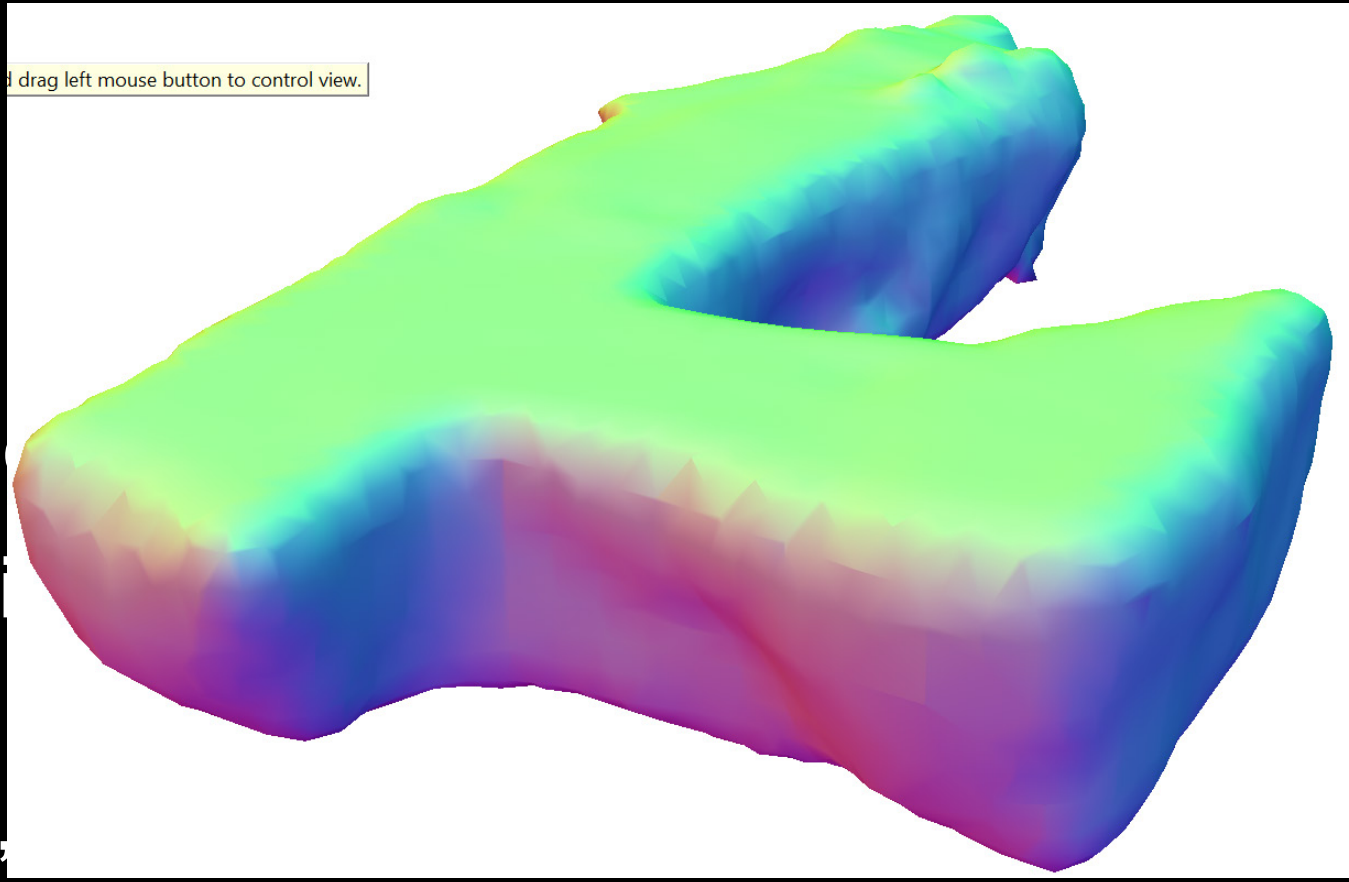
View 3D Timing

- 3D viewer for
  - Surface Equipment Timing
  - Spoil Timing
  - Haul Cycle Analysis

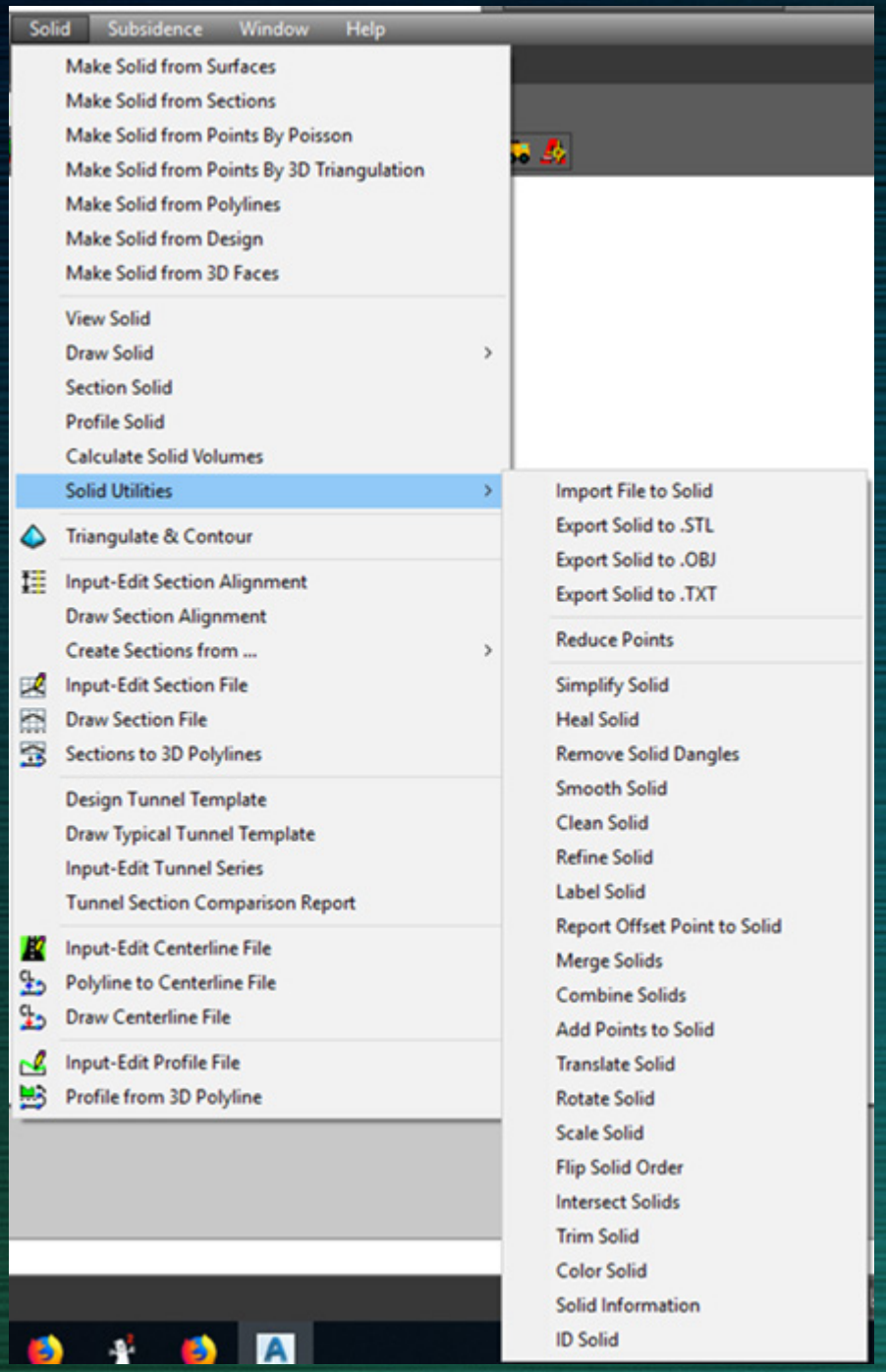


Solids

- Create: 3D triangulation, 3D faces, Poisson
- View: Texture, normals, elevation; smooth; display edg
- Utilities: Section, merge, simpli refine, smooth, intersect
- Import/Export: OBJ, STL, DXF, SJP



Solids Enhancements



Point Cloud

- Basic Module: Subset of commands
- Draw: Cloud object
- Select: By Color, By Sphere, Coordinate Points
- Create Points By Grid
- Snaps: Cross section and curb
- View Upgrades: Clip planes, lighting controls, wireframe, speed
- Profile: Vertical walls and overhangs
- Solid: Heal, Simplify, Smooth,Volumes

For more details on Carlson 2019, see
http://www.carlsonsw.com/products/office-software/carlson-2019/

Maintenance Customers

- Notice by email
- http://update.carlsonsw.com/serial_upgrade_lookup.php
- http://update.carlsonsw.com/updates.php

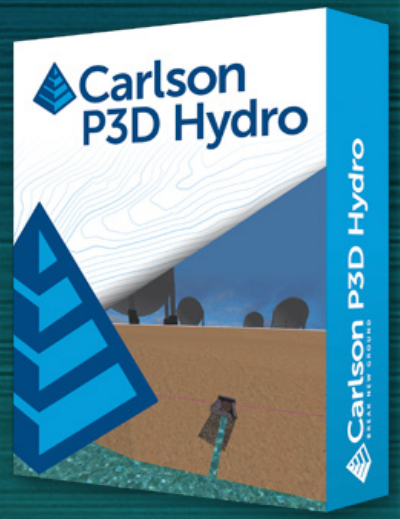
Thanks for listening.

For questions, email
support@carlsonsw.com

Or call 606-564-5028

New Office Software

P3D – Topo
P3D – Hydro
P3D – Drill & Blast >>Blast Commander
Minefeed
Carlson Photo Capture (Subscription –based)



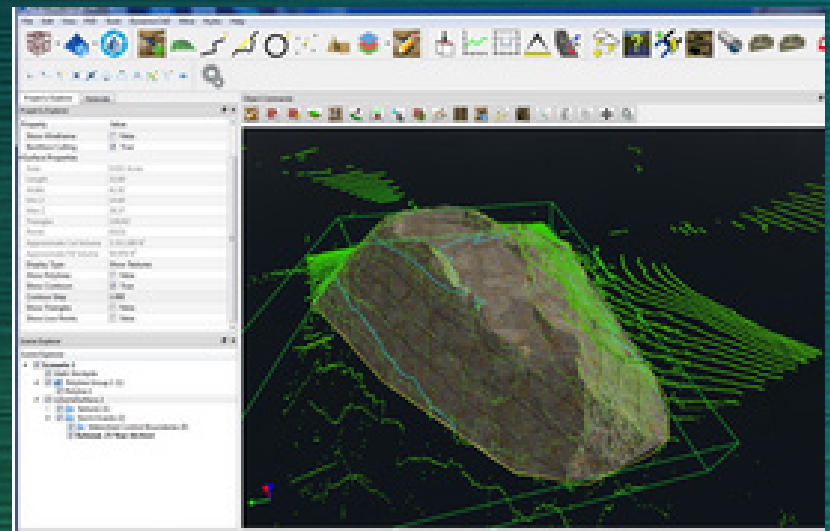
*Works with drone data

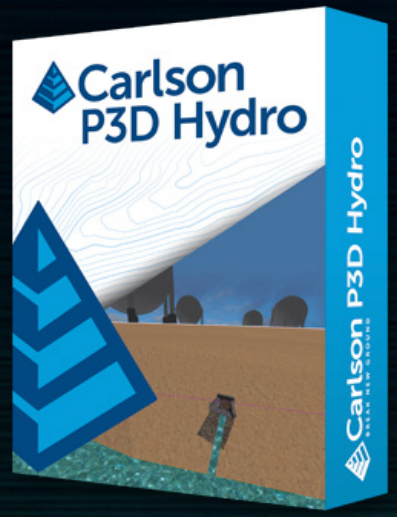
P3D Topo

Bridge the gap between drones and CAD

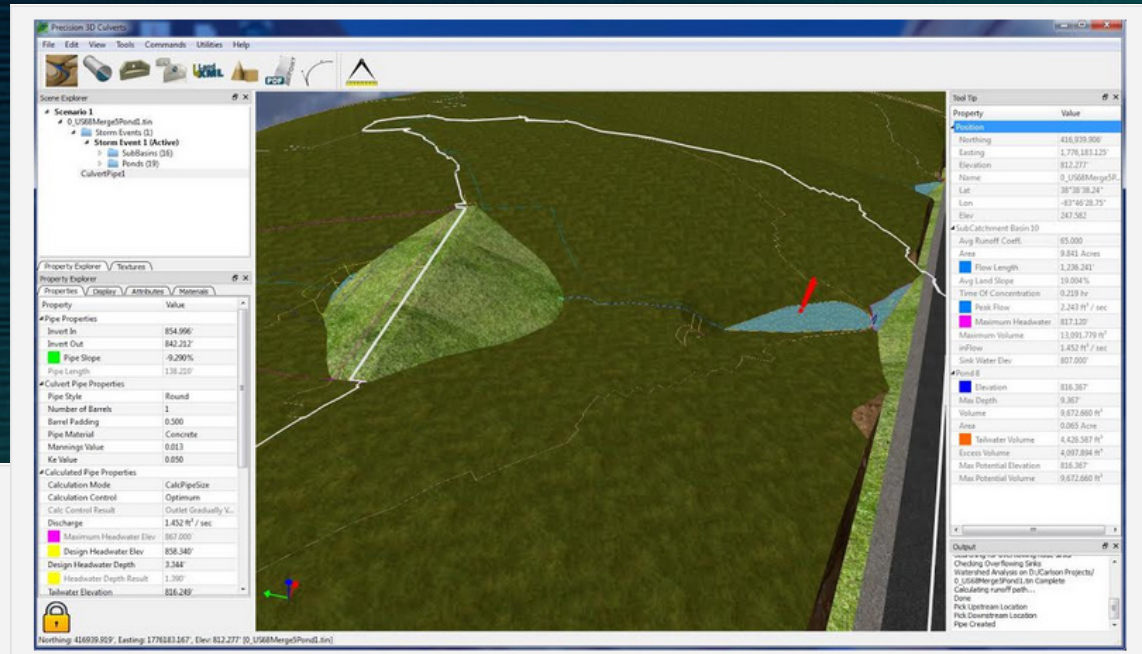
Designed for use by surveyors, civil engineers, and contractors, Precision 3D Topo allows users to import survey data, points, polylines, surfaces, point clouds, both traditional LIDAR and aerial drone survey data, and more from a wide variety of programs and entities to create usable 3D surfaces.

- Importing Point Cloud data from Lidar and Aerial Drone mapping.
- Merge and edit point clouds to create surface models.
- Import survey data to further refine surface models.
- Powerful surface Editing tools to perfect surface models. Including Google Maps photographic background, automated Google surface creation.
- Easy surface volume tools directly from point clouds or surfaces.
- Advanced Texturing and Presentation Tools
- Import / Export all data as LandXML, DXF, and Surface Models as TIN, TN3, and TTM.

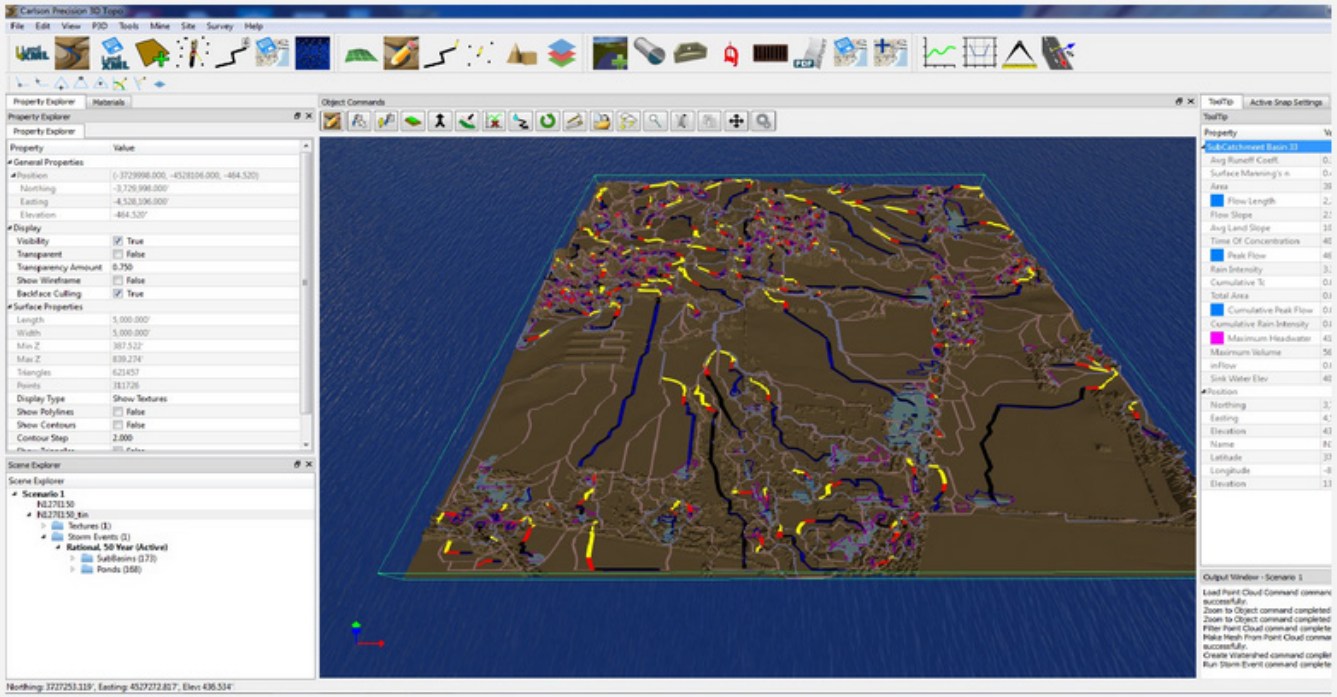




P3D Hydro



P3D solid modeling



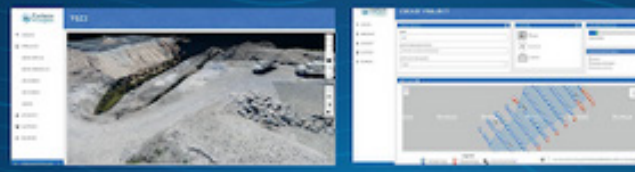
Lidar surface & watersheds

Subcatchment Name	Average Runoff Coefficient	Area [Acre]	Flow Length [US Survey Feet]	Flow Slope [Percentage]	Average Land Slope [Percentage]	Time Of Concentration [Minutes]	Peak Flow [Cubic Feet Per Second]	Rain Intensity [Inches]	Maximum Headwater [US Survey Feet]	Maximum Volume [Cubic Feet]	inFlow [Cubic Feet Per Second]	Sink Water Elevation [US Survey Feet]	Cumulative Tc [Minutes]	Total Area [Acre]	C
SubCatchment Basin 0	0.651	12.823	1518.692	7.067	20.069	41.726	28.200	3.379	835.230	758226.696	0.000	806.000	41.726	12.823	
SubCatchment Basin 1	0.650	2.048	450.480	5.328	6.831	31.721	5.280	3.966	884.000	0.000	0.000	884.000	31.721	2.048	
SubCatchment Basin 2	0.650	2.836	677.308	4.626	9.340	14.885	10.544	5.719	874.000	0.000	0.000	874.000	14.885	2.836	
SubCatchment Basin 3	0.659	30.663	1193.839	6.794	20.389	23.737	92.933	4.600	754.000	0.000	0.000	754.000	23.737	30.663	
SubCatchment Basin 4	0.670	11.717	1928.885	7.033	24.593	67.759	19.397	2.470	764.000	198725.522	121.133	746.000	67.759	55.203	
SubCatchment Basin 5	0.650	2.392	530.651	16.835	20.302	13.671	9.262	5.958	788.000	0.000	0.000	788.000	13.671	2.392	
SubCatchment Basin 6	0.650	2.063	337.261	4.744	10.579	4.032	13.238	9.871	896.000	0.000	0.000	896.000	4.032	2.063	
SubCatchment Basin 7	0.650	12.269	1342.903	22.042	31.853	16.555	43.673	5.476	594.000	0.000	0.000	594.000	16.555	12.269	
SubCatchment Basin 8	0.650	7.492	788.515	6.848	11.718	43.670	15.998	3.285	854.000	0.000	0.000	854.000	43.670	7.492	
SubCatchment Basin 9	0.650	10.774	1072.143	13.851	22.403	17.136	37.753	5.391	758.000	0.000	0.000	758.000	17.136	10.774	

P3D Hydro – Sample Report

Carlson
BREAK NEW GROUND

Carlson Photo Capture



Fast & Scalable Cloud Service

▪

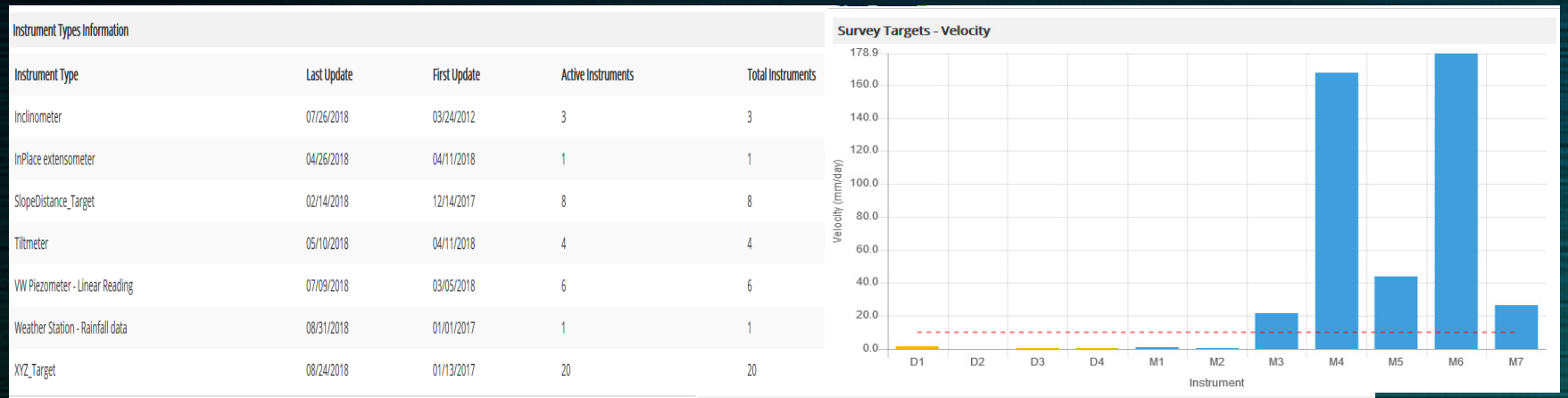
UAV Photogrammetry to 3D Data

▪

Carlson Point Cloud & P3D Topo Import

Minefeed

Slope stability monitoring software



Instrument Types Information

Instrument Type	Last Update	First Update	Active Instruments	Total Instruments
Inclinometer	07/26/2018	03/24/2012	3	3
InPlace extensometer	04/26/2018	04/11/2018	1	1
SlopeDistance_Target	02/14/2018	12/14/2017	8	8
Tiltmeter	05/10/2018	04/11/2018	4	4
VW Piezometer - Linear Reading	07/09/2018	03/05/2018	6	6
Weather Station - Rainfall data	08/31/2018	01/01/2017	1	1
XYZ_Target	08/24/2018	01/13/2017	20	20

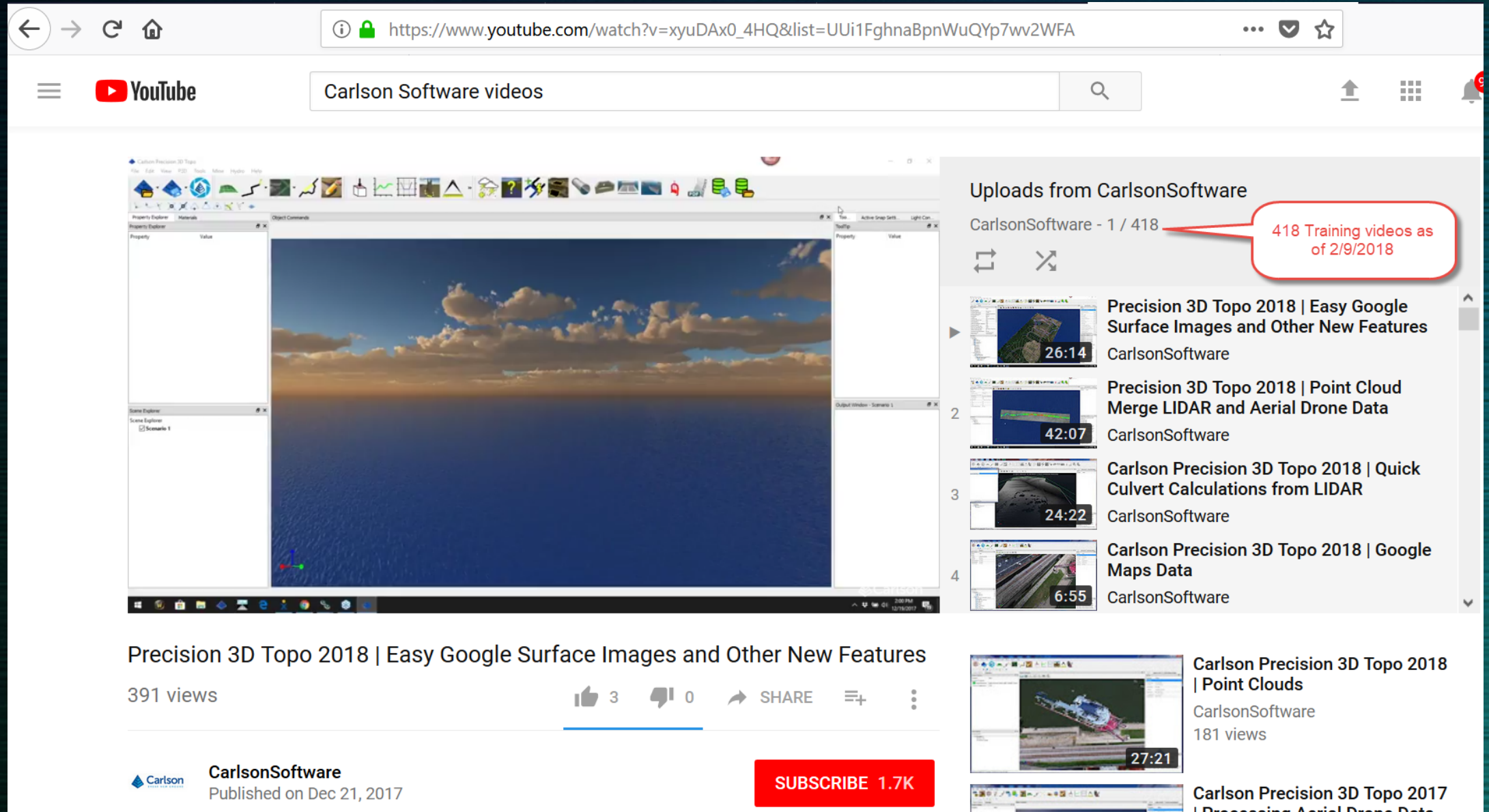
geosysta

Training and Support

Training
418 Youtube videos out there (free)
We still make house calls
We can provide online training
You can arrange training at Maysville
User Group training – we just had one in San Diego this month

and Tech Support is still free!

418 Training videos and growing



Our goal is still the same

Customer satisfaction