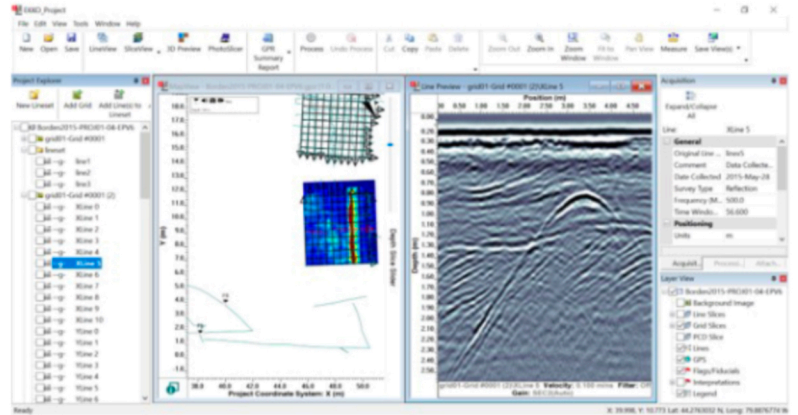


EKKO_Project makes powerful GPR data analysis simple

With EKKO_Project you spend less time organizing, editing and processing your GPR data, giving you more time to interpret and extract valuable insights.

With intuitive data visualization tools, you can view your data from different perspectives to gain a deeper understanding, and then quickly and easily produce impressive reports to share your findings.

EKKO_Project is a must for anyone using Sensors & Software GPR systems.



Software Bundles

Our software bundles consist of powerful modules that build onto EKKO_Project™ Core and expand your data analysis and visualization capabilities.

EKKO_Project Core

Examine

- LineView
- Interpretation

Reveal

- LineView
- Interpretation
- SliceView

3D Reveal

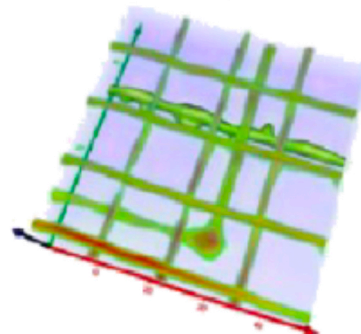
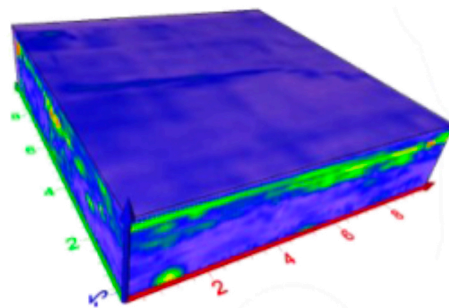
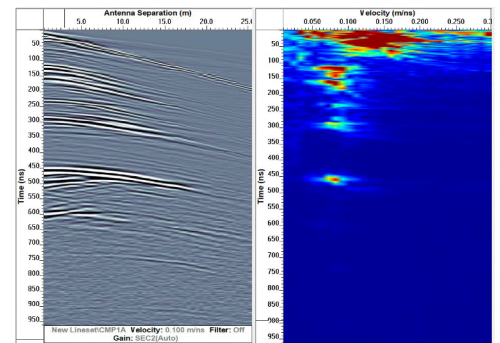
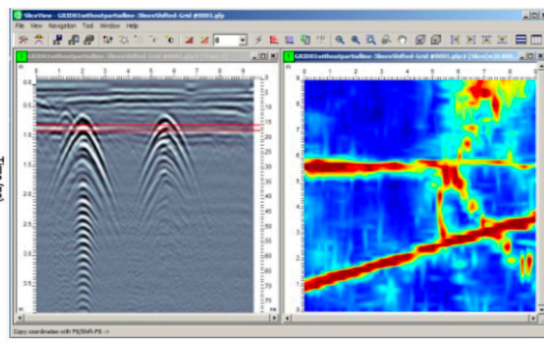
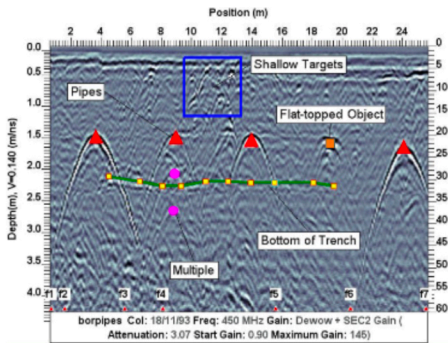
- LineView
- Interpretation
- SliceView
- Voxler

Suite

- LineView
- Interpretation
- SliceView
- Processing

3D Suite

- LineView
- Interpretation
- SliceView
- Processing
- Voxler

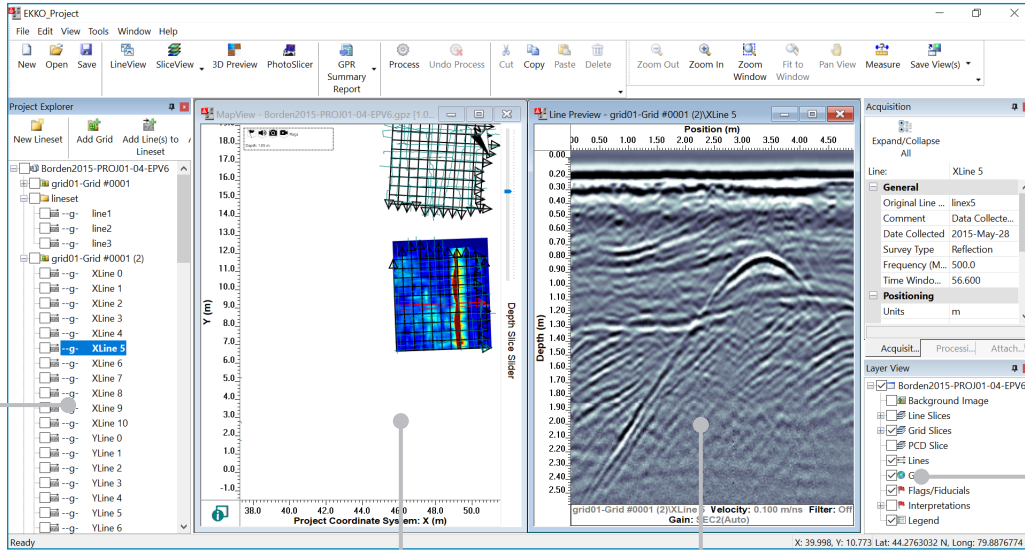




Organize GPR Data & Report Insights

See your entire project in a single view

Project Explorer:
Automatically organize your GPR data



Included in all modules

Attachments:
Attach photos and other files to your project

Layer View:
Select which Layers of Data to display

MapView: Bird's Eye view of all the data in your project

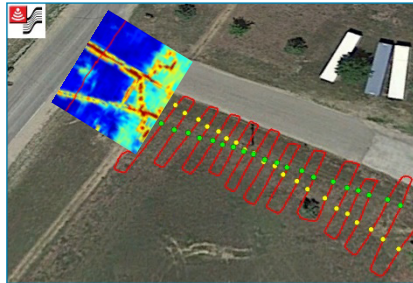
Line Preview: View GPR line data

Generate Reports in multiple file formats

PDF



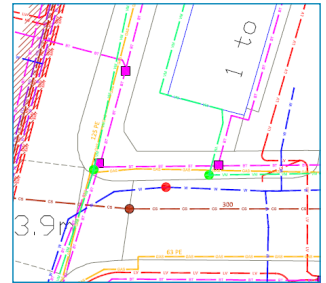
Google Earth KMZ



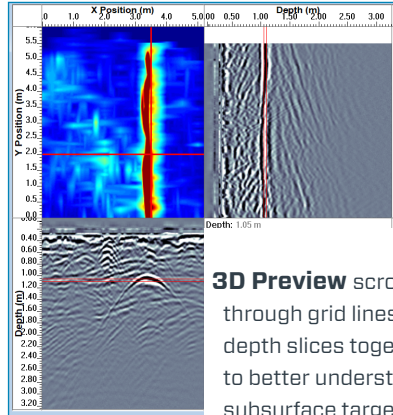
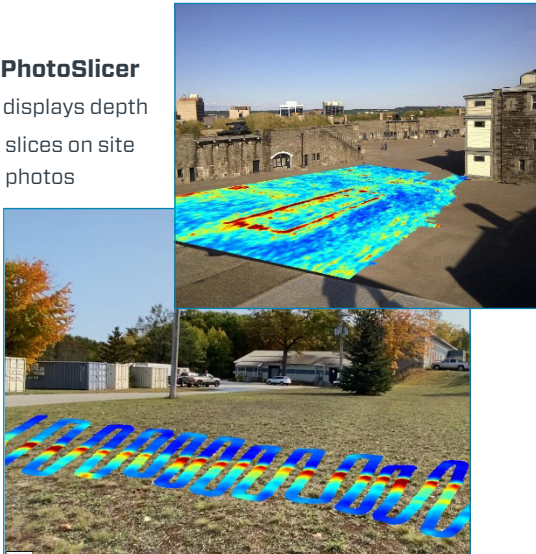
Spreadsheet CSV

Depth(m)	Time(ns)	Elevation(m)	Amplitude(mV)	Velocity(m/ns)	GPS-Latitude(deg)	GPS-Longitude(deg)	C
1.281	25.15	0.211	0.1	44.276155	-79.88712833	B	
2.275	45.02	36.622	0.1	44.27615333	-79.88713637	H	
0.135	2.41	-45	0.1	44.27617033	-79.88711667		
0.422	8.08	-3.225	0.1	44.27617833	-79.88711		
0.135	2.6	-45	0.1	44.27617333	-79.887145		
0.741	14.39	-6.74	0.1	44.27618	-79.88713667		
0.172	3.25	48.036	0.1	44.27616167	-79.887155		
0.422	8.08	3.934	0.1	44.27617	-79.88715		
1.179	23.11	15.201	0.1	44.27613167	-79.88714333		
1.165	22.25	7.553	0.1	44.27614	-79.88713708		
1.262	24.78	8.24	0.1	44.27615167	-79.88713		
1.337	26.27	4.585	0.1	44.27615833	-79.887125		
1.42	27.54	34.103	0.1	44.27616333	-79.88712167		
1.281	25.15	15.97	0.1	44.27616667	-79.88711917		
1.288	25.25	-45.616	0.1	44.27617333	-79.887115		
1.262	24.78	-30.687	0.1	44.27618167	-79.88710833		
1.067	20.86	-7.864	0.1	44.27614	-79.88716667		
1.103	22.2	-17.558	0.1	44.27614833	-79.88715167		
1.253	24.6	-31.878	0.1	44.27616667	-79.88714889		

AutoCAD DXF

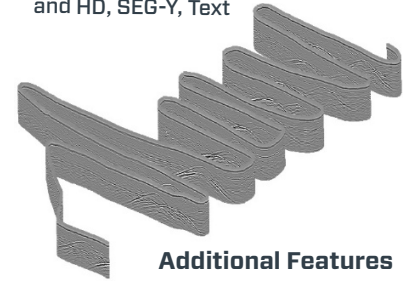


PhotoSlicer
displays depth slices on site photos



3D Preview scroll through grid lines and depth slices together to better understand subsurface targets

Export lines to Point Cloud, DT1 and HD, SEG-Y, Text



Additional Features

- Create Animations
- Geo-reference Data
- Reposition Lines
- Merge Lines
- Edit Grids
- Plot Amplitude Spectra
- Plot Frequency Spectra

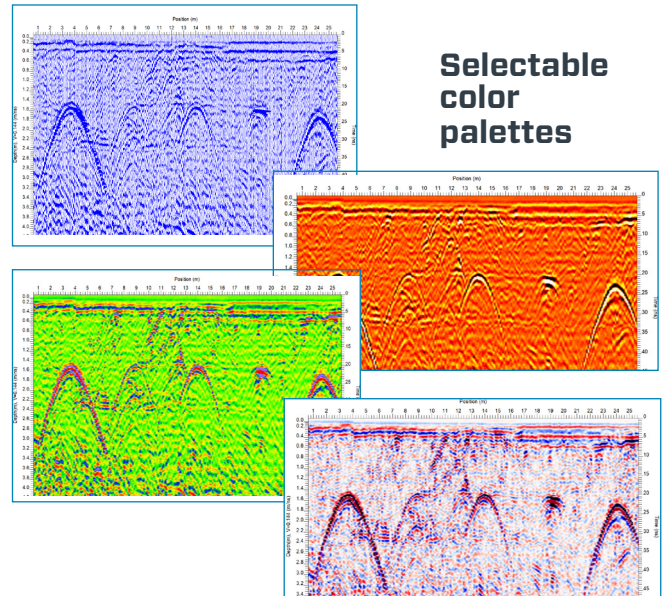
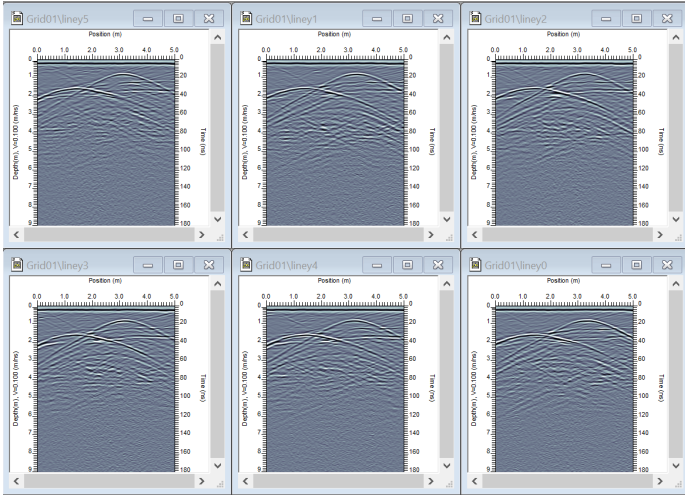


GPZ Files All GPR data, attachments and analysis files are saved in one file for easy distribution and archiving

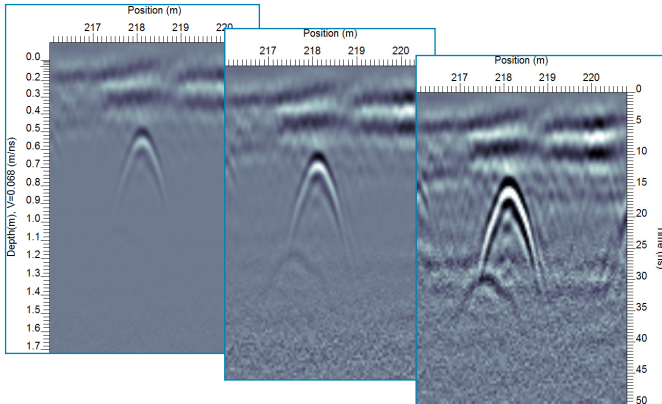
Visualize • Understand • Report

Optimize GPR Line Data

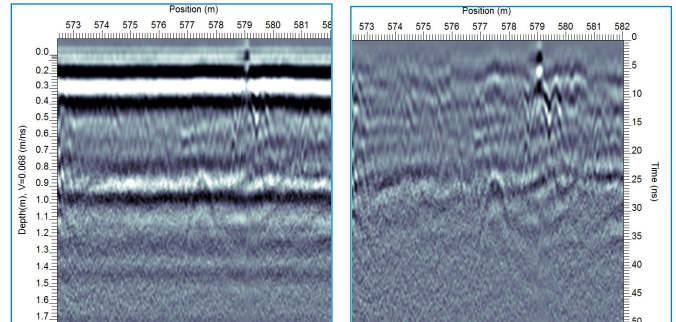
Plot and scroll multiple lines simultaneously to quickly identify targets in your data



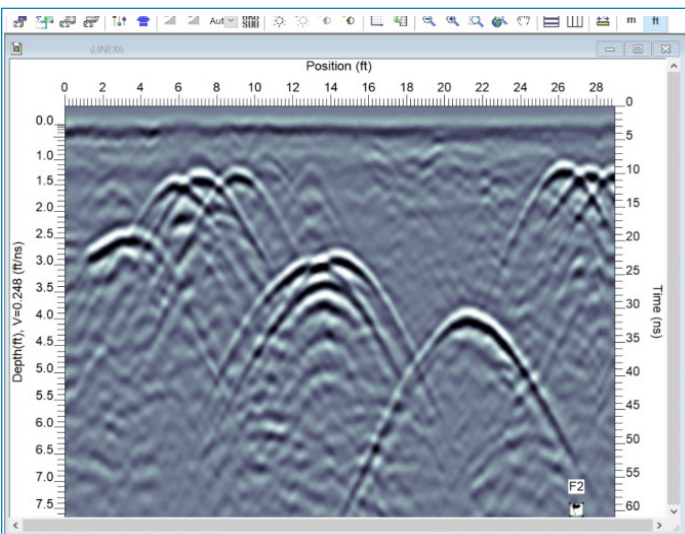
Adjust Gain to ensure deeper, weaker targets are identified



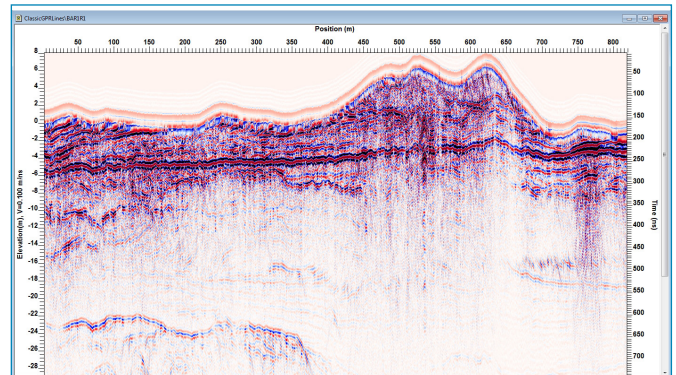
Remove flat lying reflectors that mask target hyperbolas with the background subtraction filter



Adjust Font and Axes



Plot lines corrected for elevation



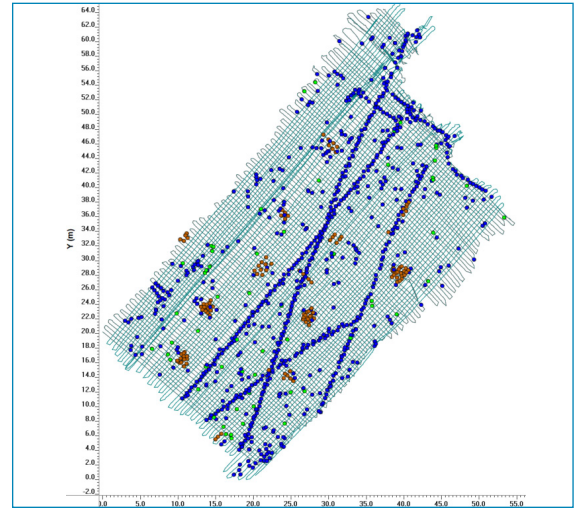
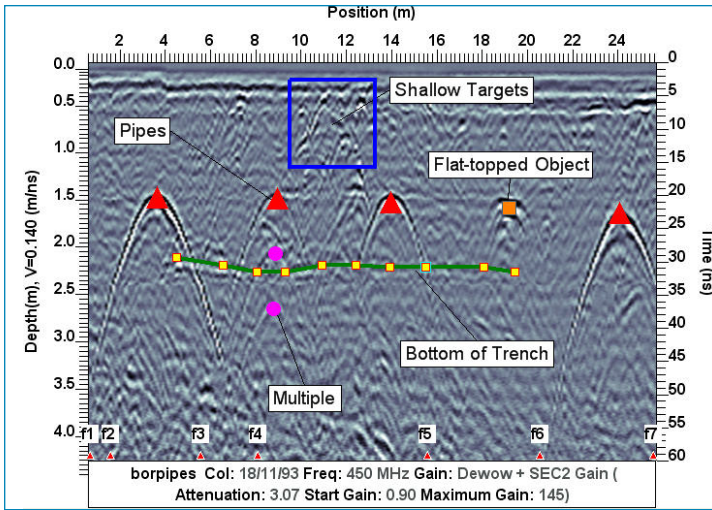
Additional Features:

- Show target position on Google Earth
- Perform a Velocity Calibration
- Display time scale
- Save images for reports in one click



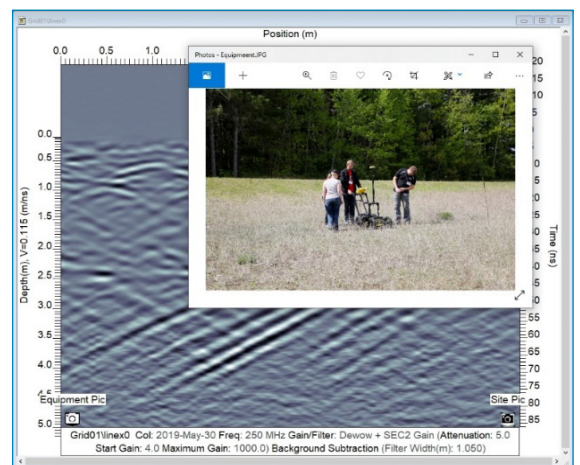
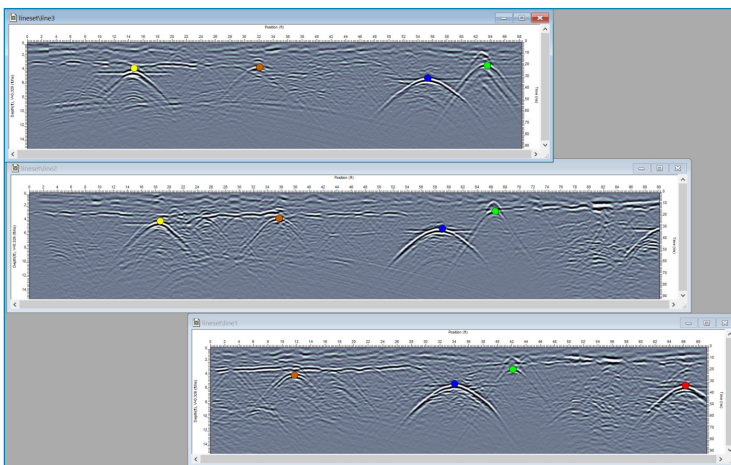


Add insights to Your GPR Data



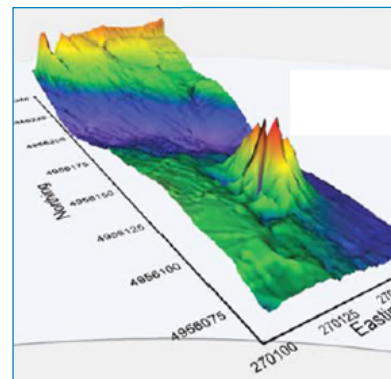
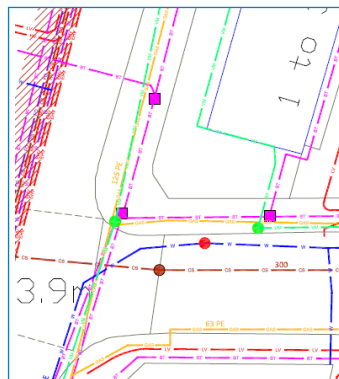
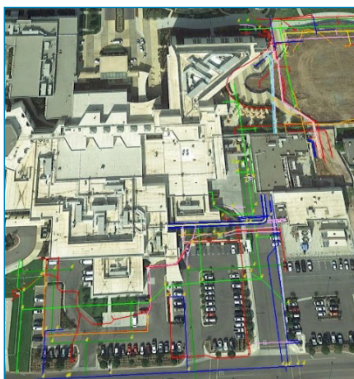
Augment your report by adding interpretations to the GPR lines: Points, Polylines, Boxes, Annotations

Plotting Interpretations in MapView confirms the locations of utilities and reveals weaker targets that could be missed



Add interpretations to multiple lines simultaneously

Add photos, videos and audio files to multi-media flags to assist with interpretations

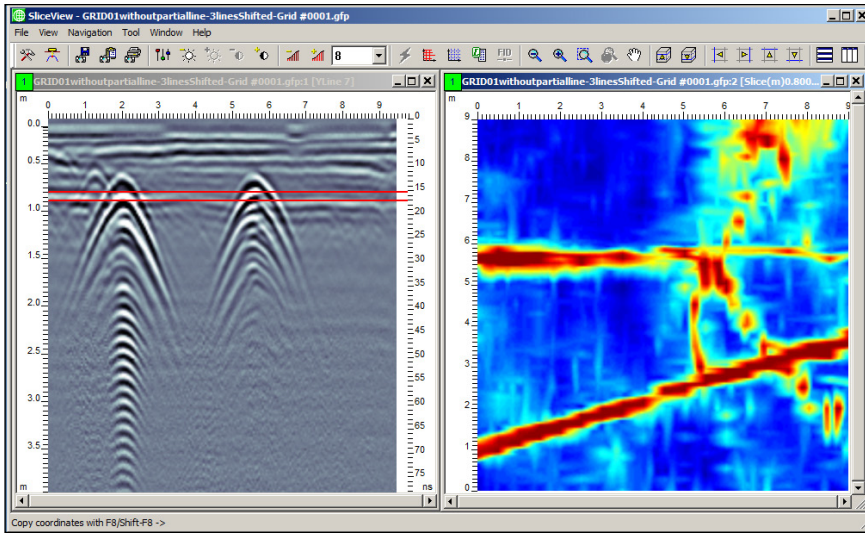


Export interpretations to other file formats: Google Earth KMZ, Spreadsheet CSV, CAD, GIS



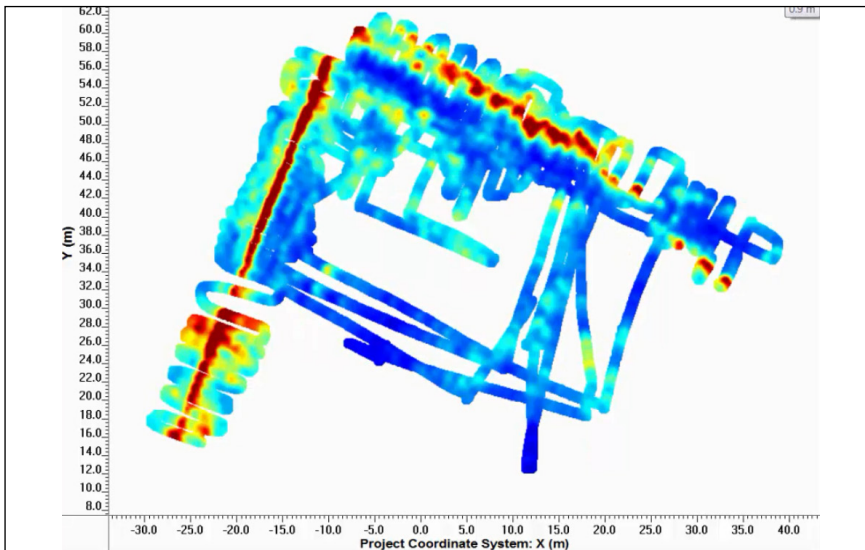


Display GPR Data as Depth Slices and Slice Down to Reveal Targets



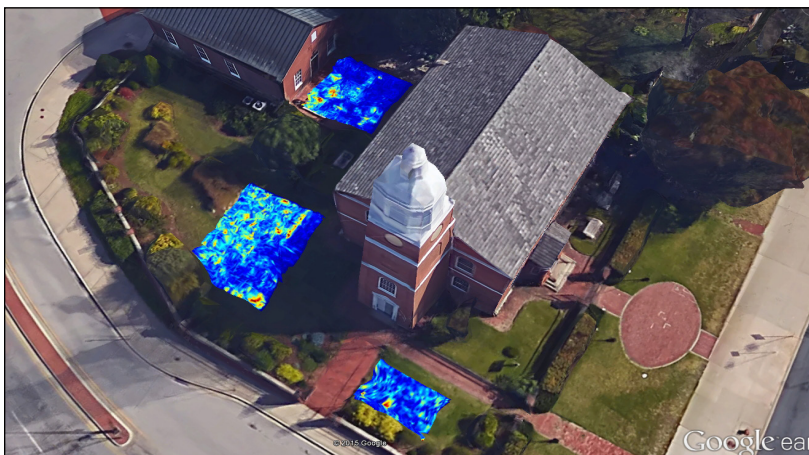
SliceView-Grid

Visualize large volumes of grid data in a map view as a series of depth slices. Scroll down through the slices to assist with interpreting the data

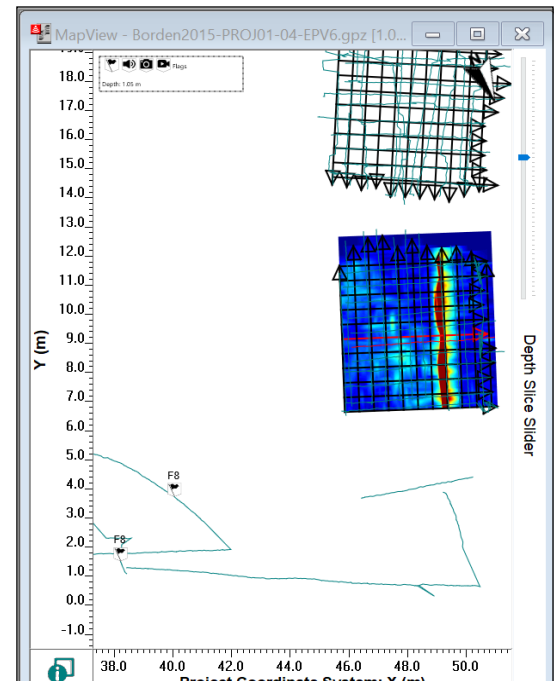


SliceView-Lines

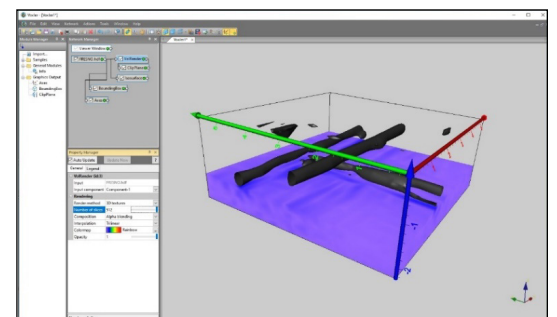
Process and display line data collected with an external GPS as depth slices



Export Depth slices to Google Earth



Once processed, depth slices are displayed as a layer in the MapView window in EKKO_Project



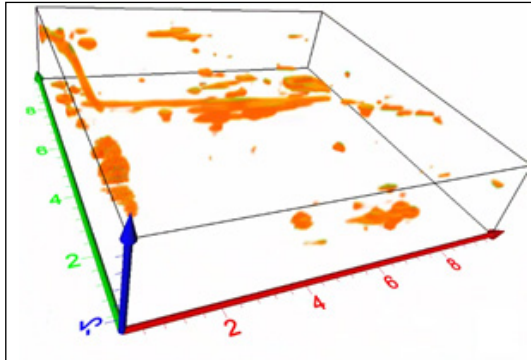
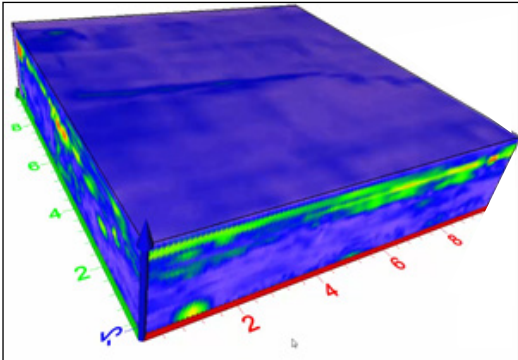
One-click data export to 3D Voxler, an optional 3D visualization program

Included in Bundles

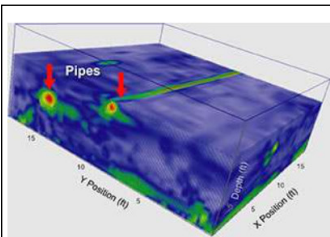
- Reveal
- 3D Reveal
- Suite
- 3D Suite



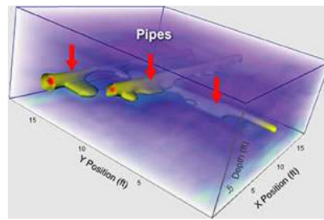
Display Grid data as a 3D volume to Reveal Targets



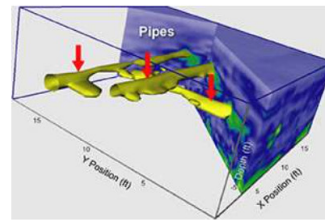
Use variable opacity plots to display the strongest reflectors in a grid, often utilities and targets of interest



Volume view



Variable-opacity

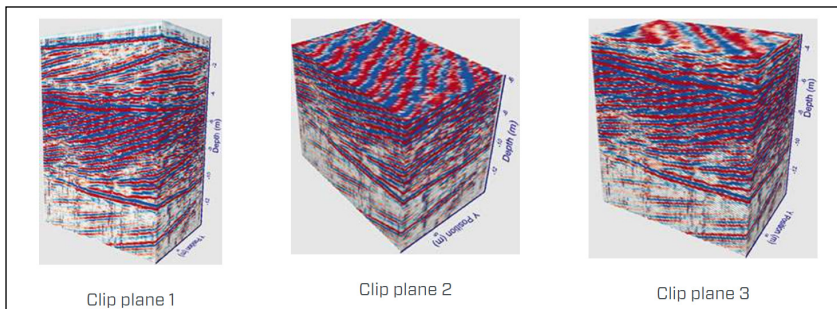
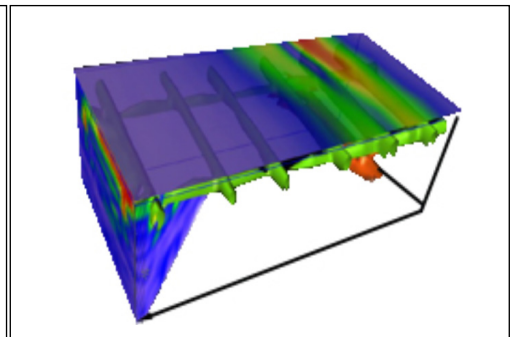
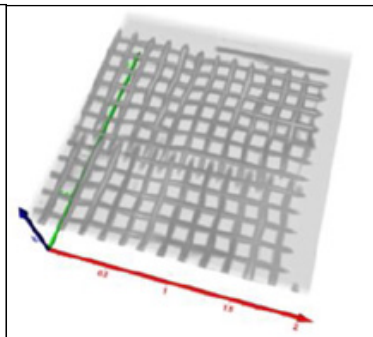
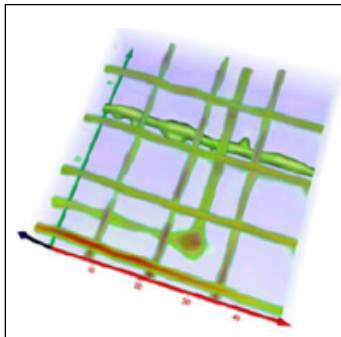


Clip planes with isosurfaces

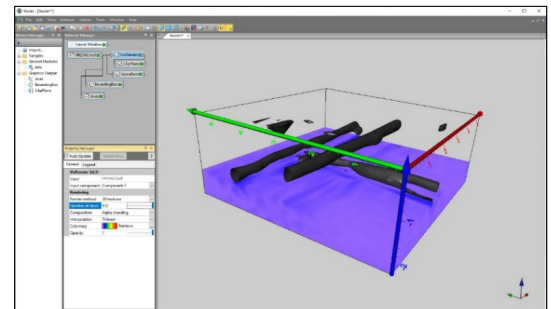
Combining volume plots, with variable opacity, Isosurfaces and clip planes produces powerful 3D images for understanding the data

3D plots

of concrete data reveal the embedded structural elements at all depths including PCD targets



Plotting a volume of geological data and using clip planes, shows sedimentary depositional structures, such as foreset bedding, in 3D



3D GPR data automatically opens in the Voxler program when launched from SliceView

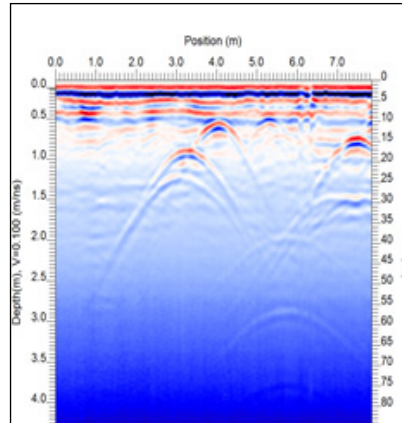




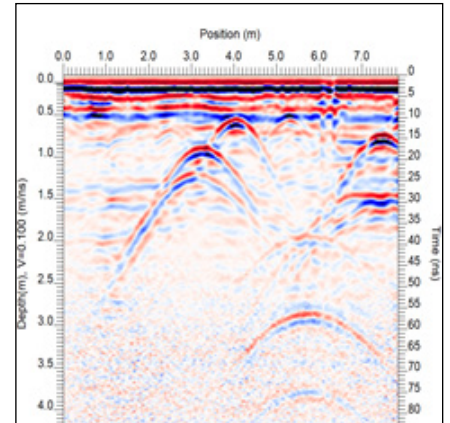
Edit and apply processing tools to GPR lines to further analyze the data

Processing Tool

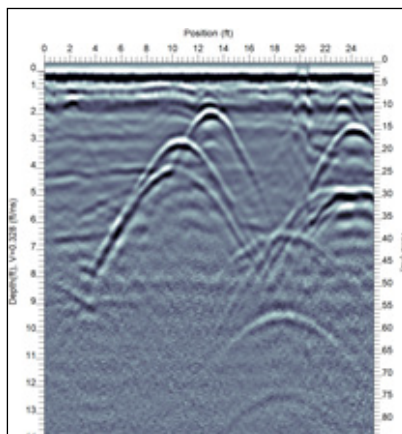
Editing	Cropping Position, Cropping Time, Padding Position, Padding Time, Reverse Line, Reposition Traces, Reposition using GPS, Delete Traces, Insert Traces
Instantaneous Attributes	Envelope, Frequency, Phase
2D Filters	FK, Kirchhoff Migration
Spatial Filters	Background Subtraction, Horizontal, Median
Time Filters	Dewow, DC Removal, Bandpass, Highpass, Lowpass, Median, Vertical, Deconvolution, DynaT
First Break	Edit First Break, Repick First Break
Gains	SEC, AGC, Constant
Operations	Frequency Spectra, CMP/WARR Analysis, Mute Data, NMO Correction, Rectify Traces, Declip



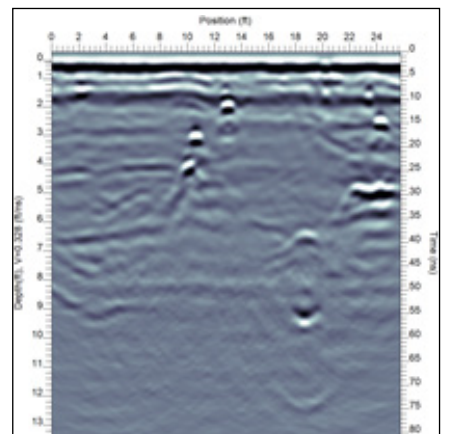
No Dewow



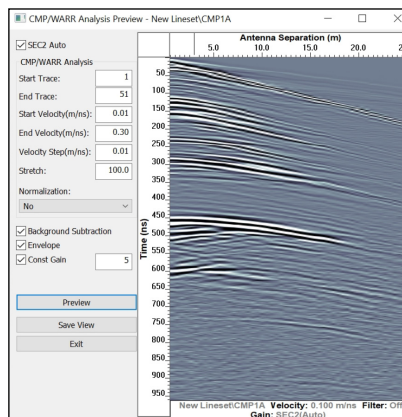
Dewow Time Filter Applied



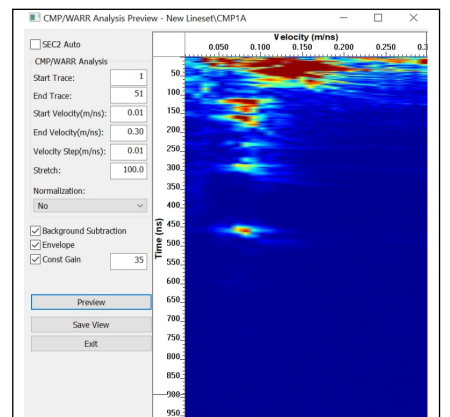
Original GPR Line



After FK Migration



CMP/WARR Data



Velocity Plot after CMP/WARR

Included in Bundles

- Suite
- 3D Suite



Automatically generate reports with amplitude and attenuation plots from rebar interpretations

Bridge Deck Condition Report

Bridge Deck Name:

Bridge Deck Description

# of Lanes:	<input type="text" value="2"/>
Surface Material:	<input type="text" value="Asphalt"/>
Surface Condition:	<input type="text" value="Fair"/>
Expansion Joints:	<input type="text" value="Yes, 2"/>
Divided Center Median:	<input type="text" value="No"/>
Additional Information:	<input type="text" value="Dry and sunny, 20 C"/>

Location Description

GPR Survey:

GPS System:	<input type="text" value="TopCon SGR-1"/>
GPR System:	<input type="text" value="NOGGIN"/>
System Configuration:	<input type="text" value="SmartChariot"/>

GPS Location(Center of bridge deck):

Easting: 608178.801
Northing: 4830961.386
Zone: 17T

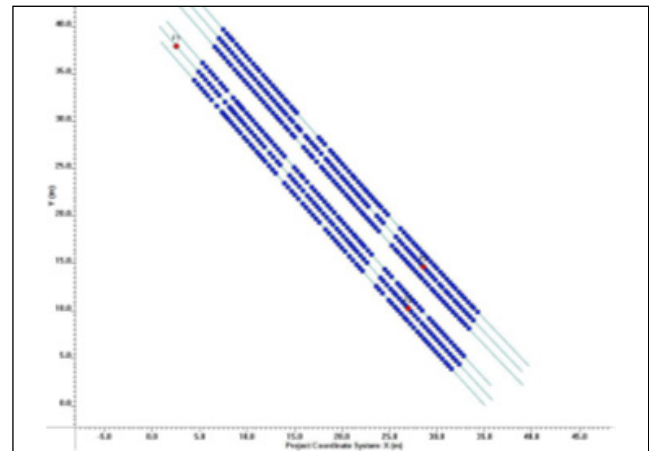
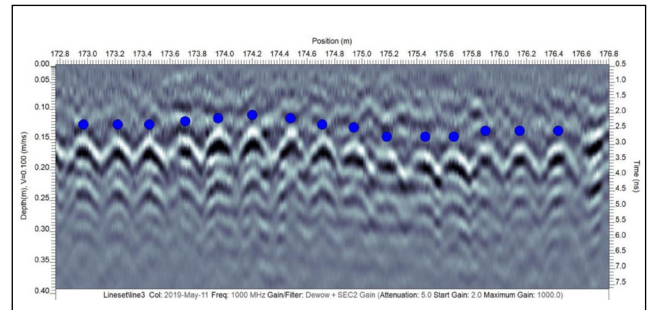
Processing Summary:

Processing Type: ASTM_D6087_08
GPR Signal Processing Velocity: Local (0.133 - 0.133 m/ns)
Analysis Date: Wednesday, October 22, 2014
Number of measurements: 456
Interpolation Type: Auto (2.115 m)

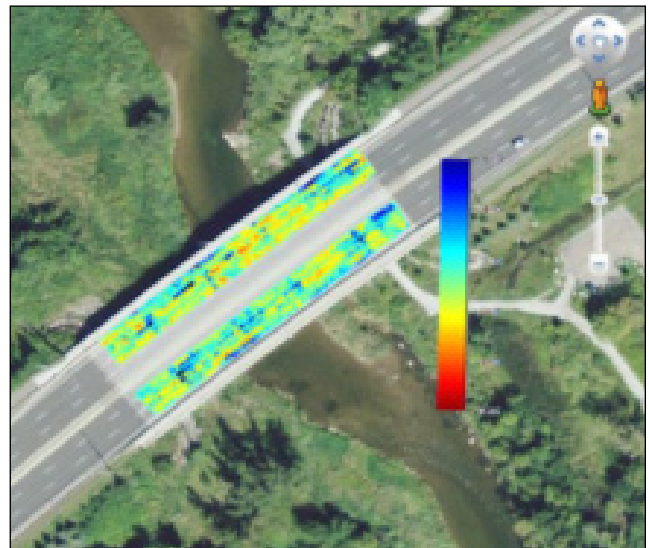
Bridge Deck Amplitude Image:

Statistical Summary:

	GPR Amplitude (dB)	Reinforcement Depth (m)	Reinforcement Spacing (m)
Minimum	-2.950	0.142	0.313
Maximum	34.567	0.294	2.064
Average	8.175	0.224	0.529



Picked Rebar (blue dots) on GPR line (top) and in map view (bottom)



Amplitude plot of picked rebar on the bridge deck displayed on Google Earth

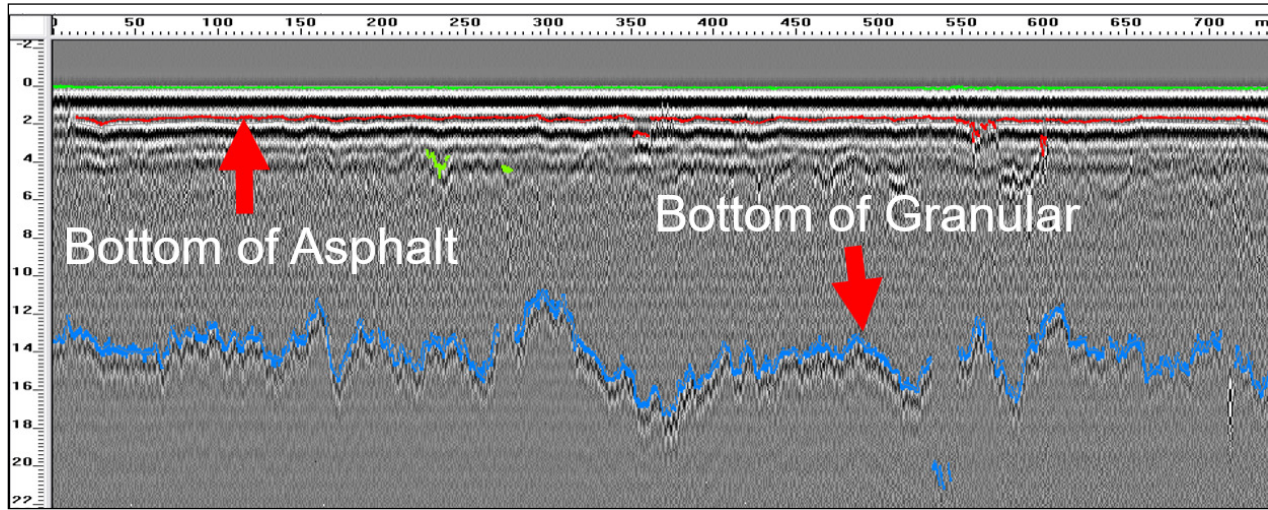
The pre-defined Bridge Deck Condition Report includes an amplitude or attenuation plot, based on ASTM 6087, of the bridge deck as well as picked rebar statistics

Visualize • Understand • Report

Requires one of these Bundles

- Examine
- Reveal
- 3D Reveal
- Suite
- 3D Suite

Extract road layer thicknesses and generate a report



Sensors & Software GPR Pavement Structure Report

Road Name:
Pavement Example Data

Road Description

Number of Lanes: 2
 Surface Material: Asphalt
 Surface Condition: Fair
 Additional Information:

GPR Survey

GPR System: NOGGIN
 System Configuration: SmartChariot
 GPS System:

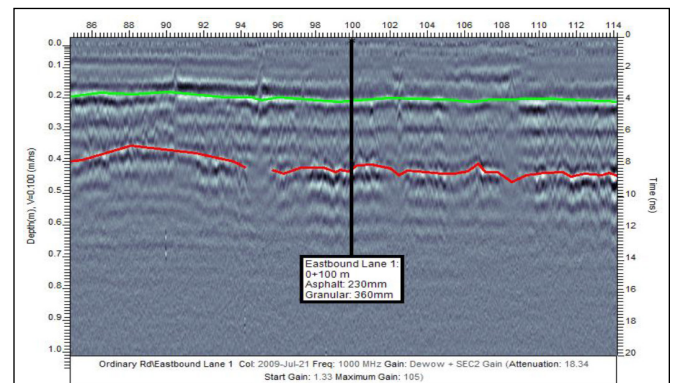
Pavement Structure Summary:

Layer	Signal Velocity (m/ns)	Thickness (mm)		
		Minimum	Maximum	Average
Asphalt	0.105	133	250	195
Granular	0.105	169	309	236

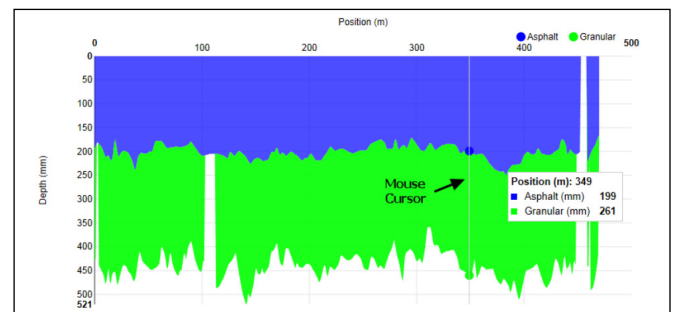
Line Name: Ordinary Rd - Eastbound Lane 1

Layer	Minimum	Thickness (mm)		Average
		Maximum	Average	
Asphalt	133	240	168	
Granular	170	289	233	

Ordinary Rd - Eastbound Lane 1 - Profile 1 of 1



Road layers are picked, usually based on core information



Position(m)	Asphalt1(m)	Layer2(m)	Layer3(m)	Layer4(m)	Latitude	Longitude	UTM Easting (105)	UTM Northing (105)
0	0.18				37.4957	-122.3101	560988.261	4150084.267
1	0.181	0.202	0.31	0.287	37.4957	-122.3101	560987.151	4150084.654
2	0.183	0.204	0.296	0.297	37.4957	-122.3101	560986.115	4150085.017
3	0.185	0.205	0.294	0.296	37.4957	-122.3101	560984.968	4150085.411
4	0.187	0.203	0.311	0.283	37.4957	-122.3101	560983.945	4150085.764
5	0.186	0.204	0.322	0.278	37.4957	-122.3101	560982.807	4150086.152
6	0.185	0.203	0.337	0.267	37.4957	-122.3101	560981.681	4150086.537
7	0.184	0.2	0.353	0.259	37.4957	-122.3101	560980.602	4150086.905
8	0.184	0.198	0.356	0.266	37.4957	-122.3102	560979.555	4150087.28
9	0.183	0.196	0.353	0.267	37.4957	-122.3102	560978.411	4150087.67

The pre-defined GPR Pavement Structure Report provides statistics and detailed thickness information of picked layers

Detailed layer thickness information is available interactively, using the mouse cursor, or output to a CSV spreadsheet file.

Requires one of these Bundles

- Examine
- Reveal
- 3D Reveal
- Suite
- 3D Suite