

- when it has to be **right**



# Leica Geosystems Release Notes

**Product**     Leica Infinity  
**Date**         7<sup>th</sup> May 2024  
**From**         Kevin Hanson

## Leica Infinity v4.1.4





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## 1 WELCOME TO INFINITY V4.1.4

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### LEICA INFINITY V4.1.4

Please read the following chapters carefully to learn more about what is new.

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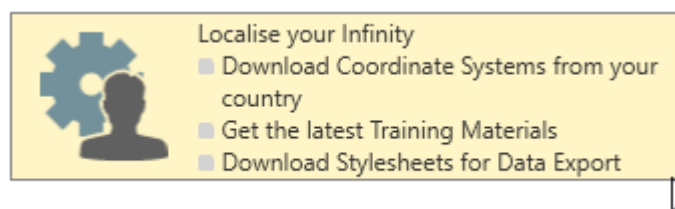
#### OVERVIEW WHAT'S NEW

- Scan Registration performance improvements
  - Bug fixes
- 

#### GETTING STARTED – HELP & SUPPORT

Getting started, users have access to information and useful data including coordinate systems, stylesheets, tutorials and sample data, all available from the *Localisation Tool*.

From the **Help** menu, click on the **Localise your Infinity** button to access this data and the tutorials to help you get started with Infinity.



#### ORDERING INFINITY

Infinity has flexible ordering options. Users can purchase a one-time permanent perpetual license or can now also buy into a subscription plan.

On top of our existing Leica Infinity – Basic package, users can also purchase additional packages depending on their needs. One of them now covers the new Point Cloud Registration option. All packages and their features can be found on the [Leica Infinity data sheet](#).

[Contact](#) your local Leica representative to discuss what options are best for meeting your project and workflow needs.

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#### YOUTUBE VIDEOS

Check the Leica Infinity [YouTube page](#) to see our playlist of videos about new features and how-to-videos.

## 2 INSTALLATION DETAILS

### INSTALLATION INFORMATION

<b>Leica Infinity v4.1.4</b>	Build	Maintenance End Date
	45710	22 <sup>nd</sup> June 2023
<i>Leica Infinity is available as a Windows 64bit only application</i>		

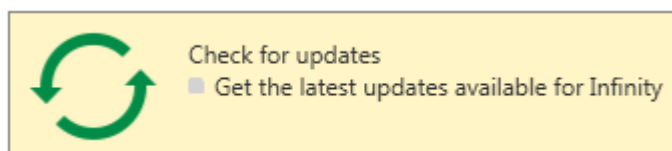


With an active CCP or Leica Infinity subscription license, users will be able to update to this new version. Confirm that your Maintenance End Date is on or after the date listed above before installation.

New users can download the latest version from the Leica Geosystems [myWorld](#) support website.

### CHECK FOR UPDATES

From *Help & About* choose **Check for updates**. When a new version is available you will be notified that the update can be downloaded from [myWorld](#).



### OPERATING SYSTEM REQUIREMENTS

The following Microsoft® Windows™ operating system editions are supported:

- Windows 10
- Windows 11

Note: you must have administrative privileges on your computer to successfully install Leica Infinity.

### MINIMUM HARDWARE

- Display: 1024 \* 768 px
- Input: keyboard and mouse with wheel
- Processor: multi-core 2.4 GHz
- RAM: 8 GB
- Disk storage: 100 GB
- Graphics: DirectX9 compatible

### RECOMMENDED HARDWARE

- Dual Display: 1920 \* 1280 px
- Input: keyboard and mouse with wheel
- Processor: multi-core 3.5GHz or greater
- RAM: 32 GB or more
- Disk storage: SSD of 1 TB or more
- Graphics: DirectX11 compatible, 4 GB memory or more, CUDA capable

### RECOMMENDED HARDWARE FOR IMAGE PROCESSING, POINT CLOUD REGISTRATION

- Dual Display: 1920 \* 1280 px
- Input: keyboard and mouse with wheel
- Processor: 8 Core 3.5 GHz or more
- RAM: 64 GB or more, XMP enabled
- Disk storage: SSD of 2TB or more
- Graphics: DirectX11 compatible, 8 GB memory or more, CUDA capable

### 3 PERFORMANCE IMPROVEMENTS AND BUG FIXES

<b>Scan Registration</b>	Performance improvements working with large scan setups.
<b>Scan Registration</b>	Addressed an issue when REG360 Plus v2024.1 was installed, Scan Registration was not possible with Infinity.
<b>Import Zeno Job</b>	Addressed an issue when capturing images from some low price smartphones could cause a crash when using the Image Viewer tool.
<b>Reports -Check Measurements</b>	Addressed an issue for reporting, the defined tolerance for Check Point settings were not applied and not visible if the values were out of tolerance.
<b>Imaging - Dense Point Cloud Processing</b>	Addressed an issue for some computers when processing a dense point cloud the CPU and memory resources could reach 100% and cause Infinity to shut down, in some cases even cancelling the DPC processing event.

### 4 WHAT IS NEW IN V4.1.3

<b>Overview</b>	<ul style="list-style-type: none"> <li>Support for manually adding level staff offsets used in level processing</li> <li>Support for Leica LS10, LS15 digital level rod height offsets</li> <li>Support HxML v2.1 for Import &amp; Export</li> <li>Host of improvements and fixes throughout the application</li> </ul>
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### 5 LEVEL PROCESSING - SUPPORT FOR LEVEL STAFF OFFSETS

**Level Staff Offset** Level line processing now supports the use of offsets that can be applied with the level staff readings.



The staff offset can be assigned for the level line and then the offset value is applied for all of the turning points of the level line.

When using two staffs, customers can include a staff identification to better keep track of the staffs, specifically that the offsets can be different.

LINE00004 (11/01/2024 09:02:53)	
▲ Level Line	
Level Line Id	LINE00004
Date/Time	11/01/2024 09:02:53
Description	
Instr. Type	LS15 123456
Staff One Id	Back
Staff One Offset	0.003 m
Staff Two Id	Forward
Staff Two Offset	-0.004 m

It is also possible to edit the offset for each individual measurement if required.

Staff Reading	1.121 m
Staff Offset	0.003 m

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***Import Leica  
LS10, LS15***



The Leica LS10 & LS15 with fw v5.0 supports user entered level staff offsets. Level staff offsets when used on the instrument can be Imported using HxML or GSI formats.

The imported level data will indicate the level staff ids as well the staff offset values as were entered for preparing the level line measurement task.

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**6 GENERAL APPLICATION IMPROVEMENTS AND FIXES**

***HXML v2.1***

Now supported is the latest version of HXML v2.1 for data import and data export. When using stylesheets to fulfill custom export or reporting needs its now possible to include the circles and rectangles features by setting HXML v2.1 on export.

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***Project Properties***

Addressed an issue when changing the name of a project that was created before Infinity v4.0, it could happen that the apply button was not active so it was not possible to save the new project name.

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***Project  
Coordinates***

Addressed an issue for creating project coordinates, when using method User Entered and applying False Northing and or False Easting shifts, the shift was not applied.

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***Export DXF, DWG***

Addressed an issue when changing the rounding setting in the export window, it was not possible to export data to DXF or DWG format.

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***Import DXF, DWG***

Addressed an issue that could cause a crash when linear lengths of features are defined in linear values greater than 10,000 (Feet or Meters)

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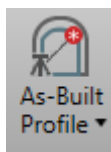
**7 WHAT IS NEW IN v4.1.2**

***Overview***

- View Tunnel As-Built Profiles and create reports
- Quality improvements in Tunneling Module
- Improved point cloud cleaning tools
- Working with Surfaces improvements
- Circles and rectangles from Captivate improvements
- General improvements and bug fixes

## 8 INFRASTRUCTURE TUNNELING: NEW AS-BUILT PROFILES WITH OVER UNDER & VOLUMES

### AS-BUILT PROFILES

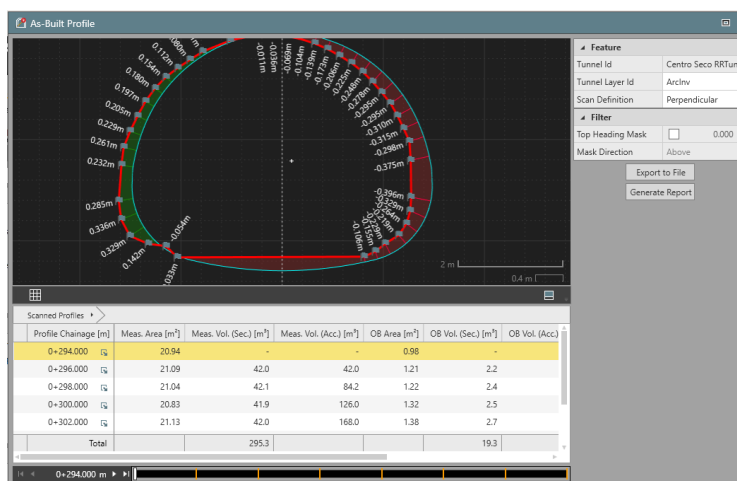


Using the Captivate Tunnel application users can import the results to Infinity and easily view measured data and create results for each profile compared to a tunnel design.

To review the tunnel profiles, from the Inspector the user selects the imported Checked Profiles they want to review and from context menu or ribbon button will choose the Tunnel design that the profiles are measured to.

With the tool open, the user can also select which layer should be used to compare the measured data.

It is also possible to set a Heading Mask, that lets the user set a limit to the area of the inspection they need to review.

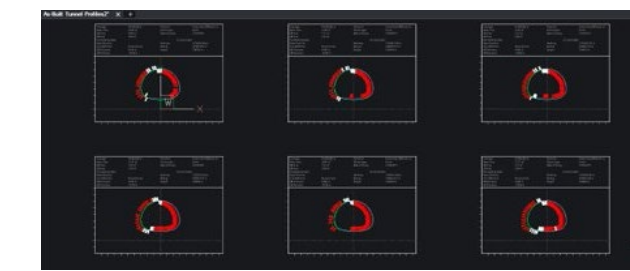


### CREATE REPORT DXF, DWG, PDF

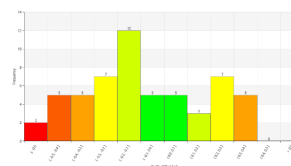
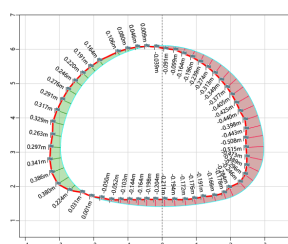
From the As-Built Profiles tool, it's possible to create a report for the selected profile inspections.

Choose Export to File for saving as a DXF or DWG format.

Choose to Generate Report to save as PDF.



Profile Chainage 0+302.000 m



## 9 POINT CLOUDS: CLEANING TOOLS

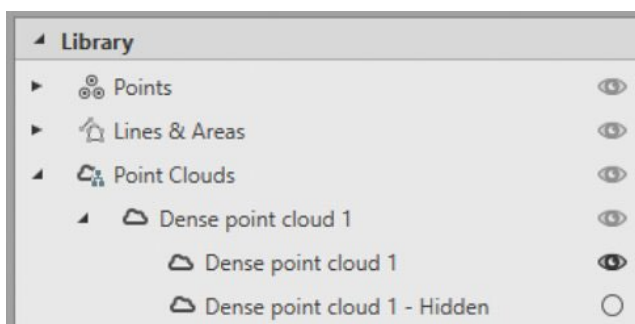
### HIDE, UNHIDE POINT CLOUDS



Working with large point clouds, users want to quickly clean up their data. Using the Hide function, Infinity now lets users separate the data they want to work with and the data they do not want to work with.

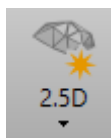
By selecting an area of the point cloud, using context menu or ribbon bar button, the user can assign data to be hidden.

A new point cloud subgroup is created to let users work with this hidden data. Once finished hiding data, the user can also delete it from the project.



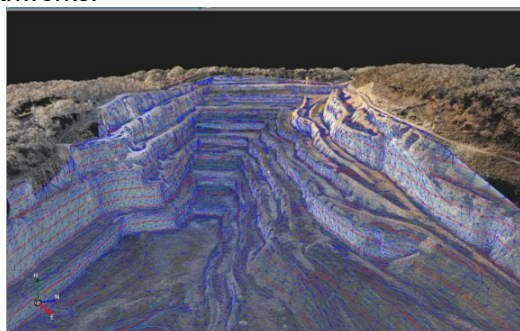
## 10 SURFACES: GENERAL IMPROVEMENTS

### SURFACES 2.5D



The surfaces engine of Infinity has been updated and brings several improvements. General surface generation delivers improved quality of the surface with better hole filling and working with noisy point cloud data. And working with large point cloud data sets the time to generate surfaces is much quicker.

Specific improvements have been made for Surfaces when using the 2.5D method. The result are having very clean and optimized triangulation, such as reconstructing earthworks.



### CUT SURFACE TOOLS



One of the time-consuming steps to good surface reconstruction is having the data reflect to real world objects, such as for boundaries or areas which should not be included in the mesh.

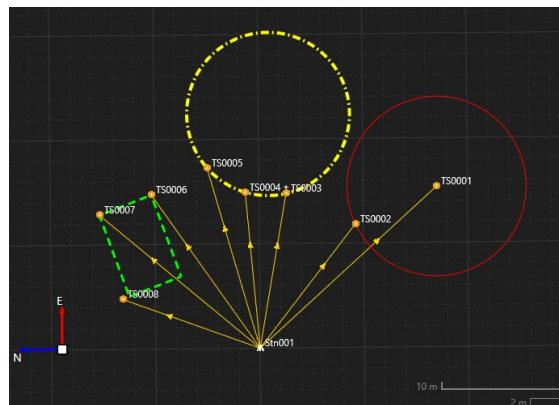
Now its possible to select a closed line or area feature and use it to cut the mesh. When working with stockpiles as example, use an imported DXF or SHP file that is the outline you want to compute a volume from. The makes it easier to compute repeatable volumes and compare differences over time.



## 11 CIRCLES & RECTANGLES WITH CAPTIVATE

### IMPORT & EXPORT

Infinity has extended support for Captivate circles and rectangles to include the methods that were used to measure. The methods are seen with the properties and also are included when exporting of the line and area features.



### LINEWORK FLAGS

From the Info & Settings page in the backstage, users can define the linework flags to be used with exporting data via xml, ascii other text format exporters.

Each of the measure methods that can be used on Captivate are maintained and depending on the export data format, the methods used to capture the rectangle and circle features will be included.

## 12 GENERAL APPLICATION IMPROVEMENTS AND FIXES

<i>GNSS</i>	<p>Performance improvements when processing of large data sets greater than 36 hours and having all constellations and frequencies.</p> <p>improvements in phase fix solutions in difficult and high multipath environments</p> <p>RTK rover points: users can again enter the individual accuracy settings considered for Network Adjustments</p>
<i>IMAGING</i>	<p>For users working with a server license, the image processing license is now automatically returned to the server when a user has completed any image processing events.</p> <p>In some cases when not connected to internet, it could have happened that a port was set disabled on the local machine, and it was not possible to process the DPC dense point cloud.</p>
<i>IMPORT EXPORT</i>	<p>Importing DGN: Set a unit when importing a DGN file. It could happen that the file had an incorrect unit defined and displayed not with the expected project data.</p> <p>Importing DJI Matrice 3 with GNSS raw data logged, importing is now possible with a fix to address wrong GNSS time format.</p> <p>Export OBJ, PLY, gITF: Export surfaces in a format that includes texture.</p> <p>Exporting line styles, a fix for the default styles exported to DXF DWG. It could happen when the code table was using a line style that is not visible in the graphic view, it was not being exported with the correct settings.</p> <p>Exporting the tolerance lines computed with Cut Fill maps, if the user defined the line style from the property grid, this line style was not exported correctly to DXF DWG</p>
<i>SERVICES</i>	<p>Procore API update: users who sign in to Procore from Infinity to directly access or upload data will need to update to Infinity v4.1.2 to continue having access inside Infinity to the Procore cloud projects. This update was made in order to consider latest data security protocols over the internet.</p>

### 13 WHAT IS NEW IN INFINITY V4.1.1: GENERAL APPLICATION IMPROVEMENTS AND FIXES

<i>GNSS</i>	<p>Fixed for baseline reports when the reference interval was shorter than the rover interval, the duration did not consider the reference interval.</p> <p>Added NGS 20 Absolute antenna calibration set.</p>
<i>IMAGING</i>	<p>Fixed an issue for BLK3D images when reverting or deleting the stored Orientation the image pose positions were not reverting to the as imported positions.</p>
<i>INFRASTRUCTURE</i>	<p>Exporting tunnel jobs to DBX the ordering of features in tunnel layers has been improved. In some cases, the order of features would reverse the cut fill values in the Stake Tunnel or Check Tunnel applications.</p> <p>Improved the import of tunnel features imported by XML when different profiles were assigned to the same station.</p> <p>Fixed a crash when working with a tunnel feature that was imported from AMBERG.</p> <p>Fixed an issue for Tunnel Sections, in some cases the validation on section 1 would persist even if the data was valid.</p>
<i>POINT CLOUDS</i>	<p>Fixed an issue for line features created from point cloud points, that when the line style had a thickness greater than 1.5, the point cloud would be drawn in black.</p>
<i>TRAVERSE</i>	<p>Using the Compute Misclosure and manually selecting the start station to close on, the height misclosure was not correct compared to when automatically closing on the start station.</p> <p>Fixed misclosure calculation when measuring a closed loop traverse and the closing station observations were compared to the starting station observations. It was computed using the start station observations and the inverse between station points and not the closing station observations.</p> <p>In the Traverse Wizard setting the start or end station selection, it is now possible to also select any measured point and not a control point or station point.</p>
<i>RENAME TOOL</i>	<p>Fixed an issue when renaming points from an imported data source, all points including the average point would be renamed not just the selected imported data.</p>

## 14 WHAT IS NEW IN INFINITY 4.1

### OVERVIEW

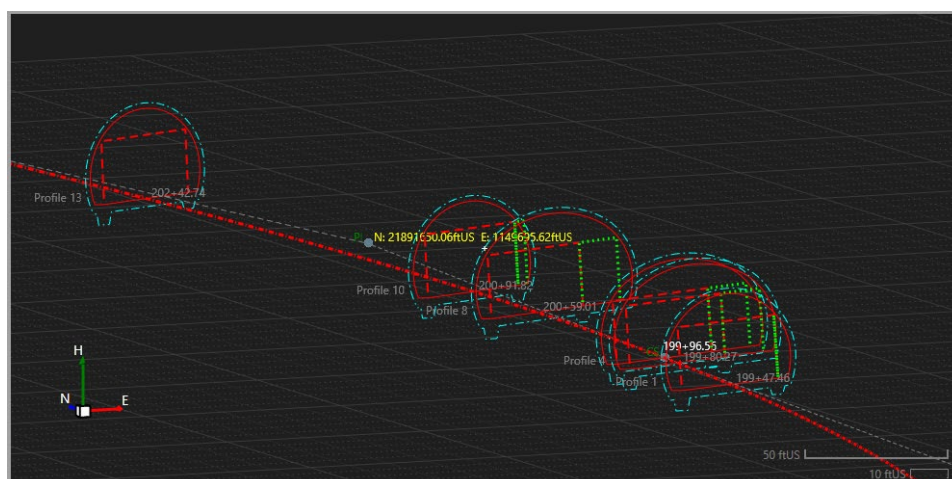
- New Infrastructure Tunneling Workflows: Combine tunnel design data with your Infinity project work for supporting Captivate with Stake and Check Tunnel applications.
- New Point Cloud Engine: work with billions of points.
- Point Clouds from Images processing improvements.
- Additional support for AP20 pole with TPS tilted measurements and auto height information.
- Host of improvements and fixes throughout the application.

## 15 NEW: TUNNELLING WORKFLOWS IN INFRASTRUCTURE MODULE

### INFRASTRUCTURE: TUNNELING

New with v4.1 Infinity can be used to manage tunneling project work supporting the Captivate Tunneling Application.

Import or input tunnel design data and define tunnel objects that are easy to work with, and easy to manage for the various project phases.

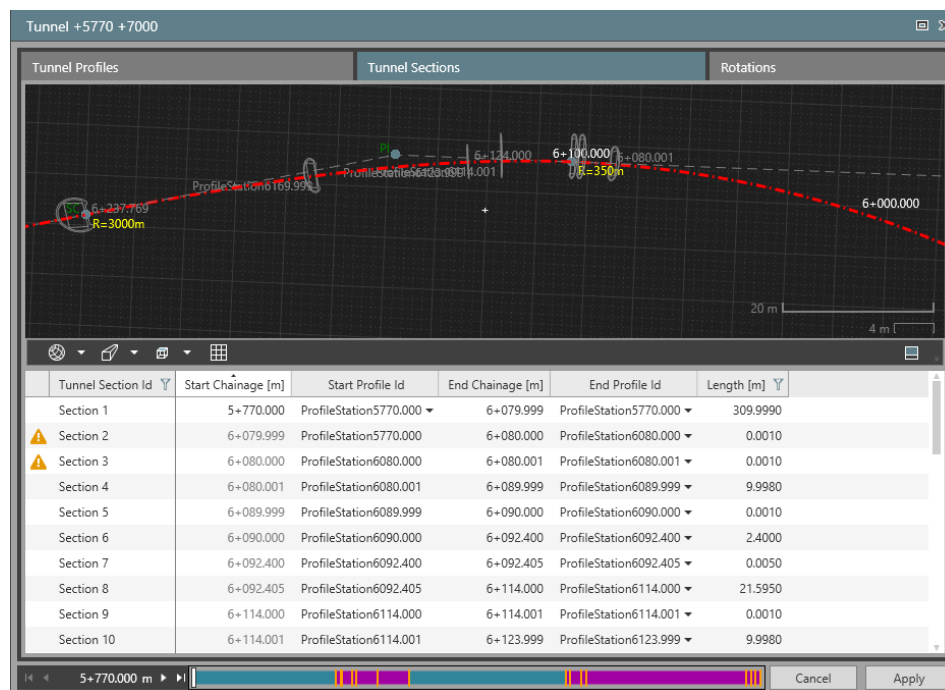


## TUNNEL FEATURE



A tunnel feature groups all tunnel related components as a single object to easily work with and view in the 3D project view. Tunnel features can be imported to an Infinity project or using design data you can manually input each of the tunnel components. Tunnels are supported by XML import or from DXF, DWG a user can create a tunnel from the CAD entities including the profiles. And for existing Captivate users working with tunnels they can import any of their DBX tunnel jobs.

The tunnel feature includes the tunnel alignment, tunnel layers, tunnel profiles and tunnel rotation tables. Tunnel sections are defined between two profiles assigned to the tunnel.

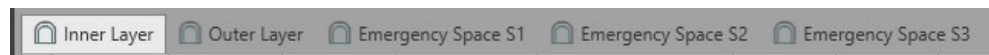


## TUNNEL LAYERS



A tunnel uses layers that refer to the many construction phases. When manually inputting the tunnel data, after creating the tunnel feature easily add the layers that define the tunnel.

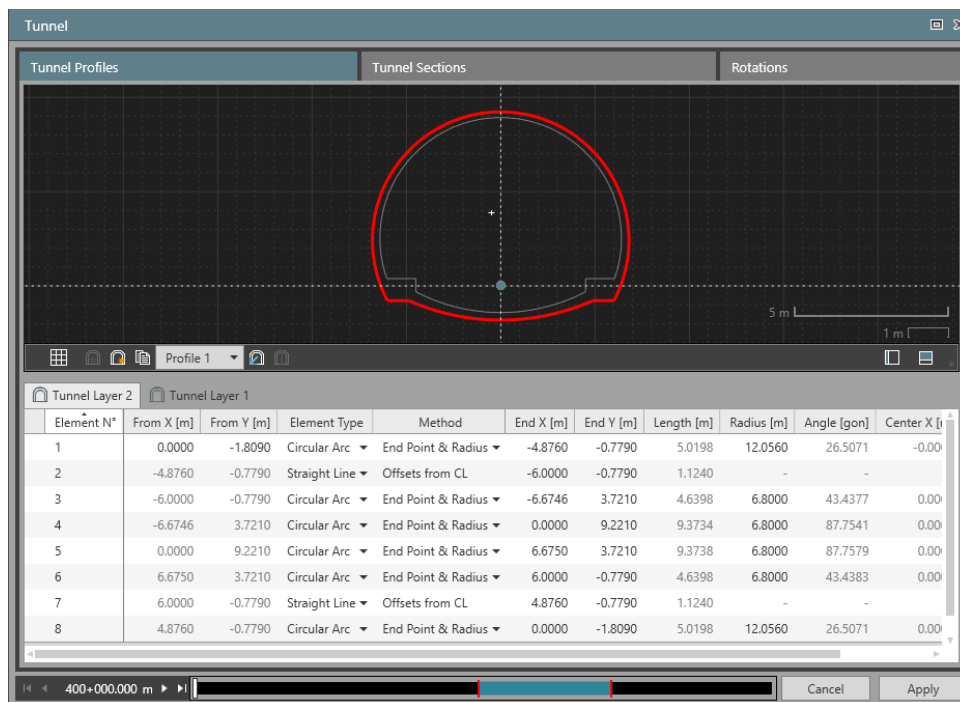
The tunnel feature can have unlimited number of layers



## TUNNEL PROFILES

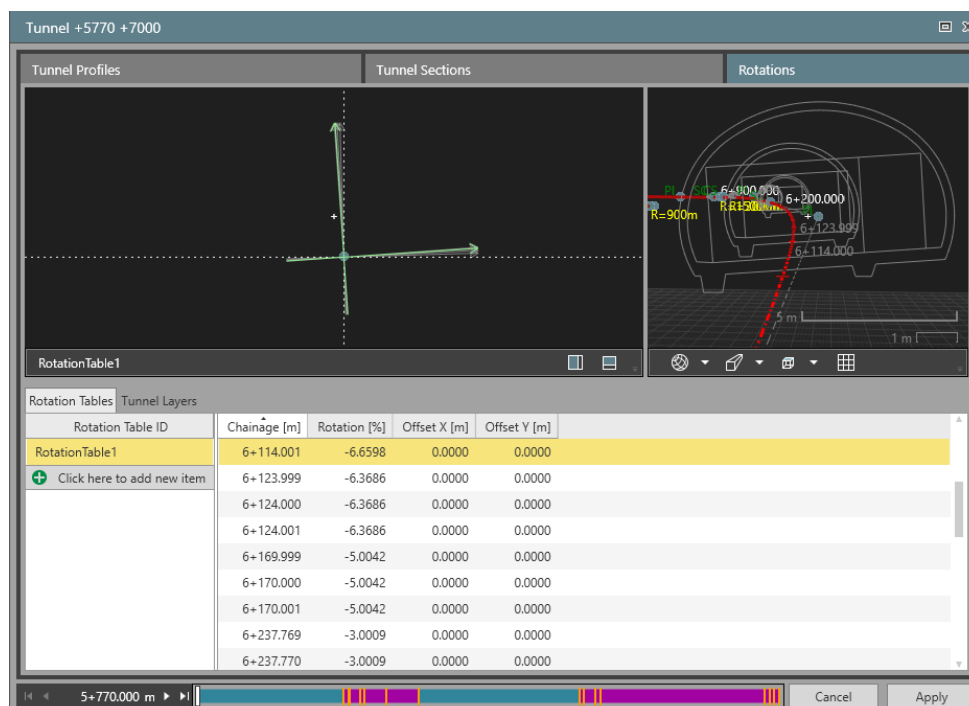
Import or input tunnel profiles to the tunnel feature. Profiles are assigned at a given station and will be used in the Captivate field software for staking or checking tasks. A tunnel profile includes the layers of the tunnel and when the profile is assigned to a tunnel it is defining the geometry of the tunnel.

Tunnel profiles are assigned to a station along the tunnel alignment and a tunnel can have many profiles assigned to it.

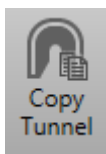


## TUNNEL ROTATIONS

Tunnel rotation tables are supported for a tunnel feature. Each rotation table includes ability to apply the rotation per each tunnel layer



**COPY TUNNEL**



Create shortened versions of a tunnel to share to Captivate. Choose a tunnel and with Copy Tunnel you can create a version of it to better manage field work. When using copy tunnel the user enters a start and end station within the selected tunnel to create a shortened version.

This lets users manage long tunnel projects with smaller tunnel data sets, making it easier to work with on the instruments.

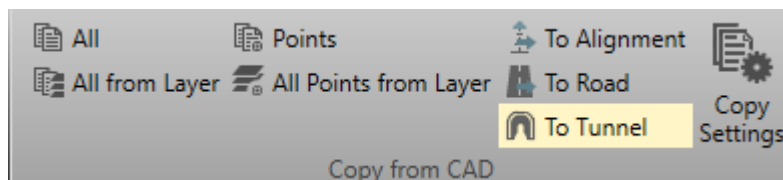
New Tunnel	
<b>Feature</b>	
Tunnel Id	Tunnel - Short Section
Date/Time	24/06/2023 08:49:08
Source	User-entered
<b>Details</b>	
Tunnel Layers	5 <span style="font-size: small;">i</span>
Tunnel Sections	1
Start Chainage	5+770.000 m
End Chainage	5+990.000 m
Tunnel Length	220.0000 m
Centerline	Surface Alignment
Start CL Chainage	4+510.000 m
Length 2D	12922.1675 m
<input type="button" value="Cancel"/> <input type="button" value="Create"/>	

## 16 IMPORT TUNNELS FROM CAD FILES

### *COPY TO CAD TO TUNNEL*

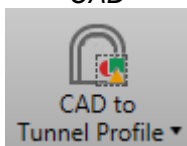
Many tunnel designs are provided in a CAD file format including the alignment and 2D profiles.

The easiest way to create a tunnel from a CAD file is by selecting the alignment from CAD and use the Copy to Tunnel function.



This creates a tunnel feature with the selected alignment. Add tunnel layers as required.

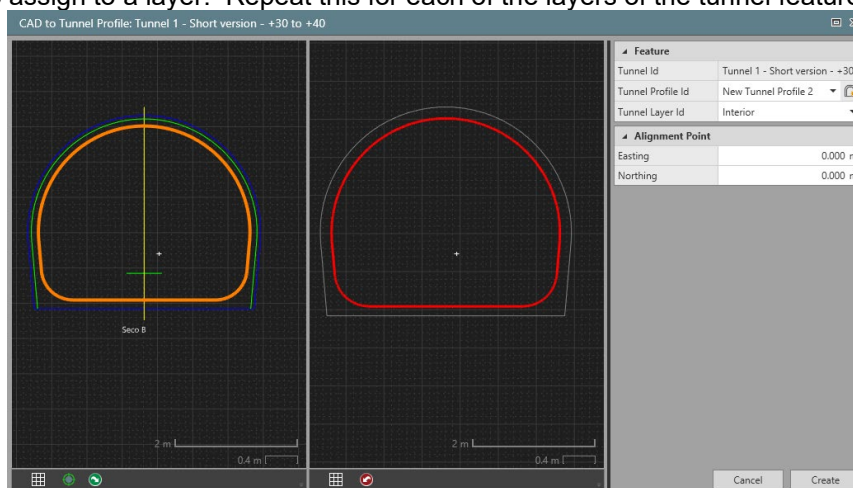
### *PROFILES FROM CAD*



The CAD to Tunnel Profile is a quick way to define the profiles to build the tunnel you need to work.

Select the profile feature and open the CAD to Tunnel Profile tool.

From the working window you define the insertion point and then select the profile you want to assign to a layer. Repeat this for each of the layers of the tunnel feature.



## 17 IMPORT TUNNELS FROM XML

### *DESIGN 2 FIELD XML*

Infinity v4.1 supports the import of tunnel features in XML format. The installed Design 2 Field tool saves infrastructure data in XML and supports the import of many legacy road and tunnel ascii data formats. Use the Design 2 Field tool to import from an ascii format and save as an XML that can be imported to your Infinity project.

### *AMBERG XML*

Infinity v4.1 supports the import of tunnel design data from AMBERG Technologies. Use this to support project work where you want to combine tunnel tasks with other survey tasks.



## 18 POINT CLOUD ENGINE

### *SUPPORT FOR BILLIONS OF POINTS*

With Infinity v4.1 a new point cloud engine has been integrated. This means users can easily be working with BLK360, RTC360 and UAV drone data in a single project and get the most from combining point clouds for project deliverables. The general navigation of project data is vastly improved.



### *IMPROVED EDIT OF POINT CLOUDS*

With the new point cloud engine, the time needed for editing of point cloud is improved significantly. Quickly use Clean, Reduce and Delete to arrive at your working point cloud.

### *POINT CLOUD PROPERTIES*

A new option in point cloud properties lets the user set the density of each individual point cloud. Use this when working with various sources of point clouds and needing to balance out the view depending on the density of the point cloud.

## 19 AP20 AUTOPOLE

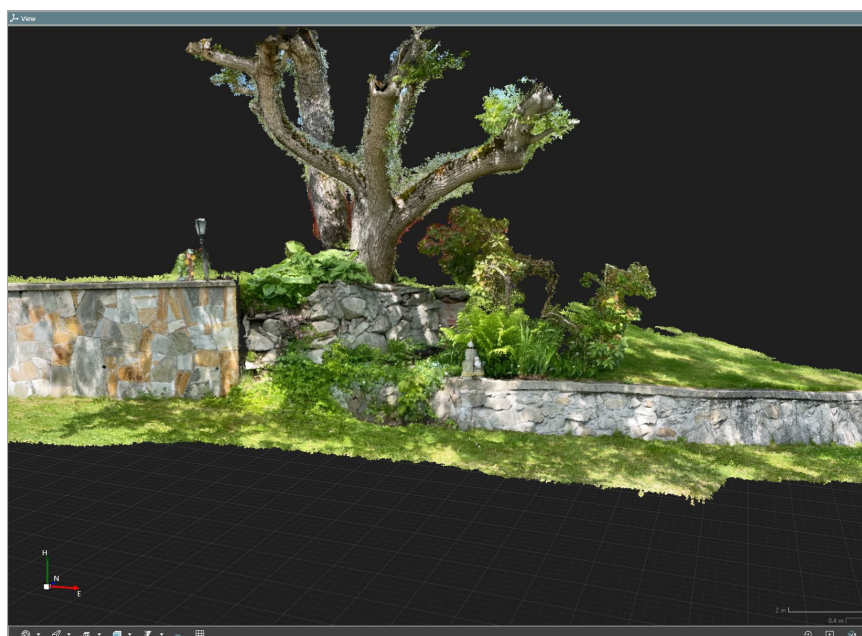
### *AP20 SUPPORT*

Leica Infinity 4.1 supports the Leica AP20 AutoPole, a productivity-boosting smart system for Leica robotic total stations.

Import and easily identify all your tilt-compensated measurements that were used for Survey and Stakeout applications. Know which measurements used the *PoleHeight* functionality from the field or if the height of the pole was entered manually. In the office, Leica Infinity supports the reprocessing of AutoPole measurements.

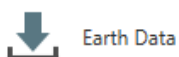
## 20 IMAGING: POINT CLOUDS FROM IMAGES

<i>PERFORMANCE IMPROVEMENTS</i>	Leica Infinity 4.1 brings several improvements processing times and data outputs.
<i>ORIENTATION: PRECISE MODE</i>	Precise Orientation mode processing times are significantly improved. Use this mode for the best results with GS18 I, handheld image data sets like BLK3D and in general for image groups of less than 1 Gigapixel.
<i>ORIENTATION: FAST MODE</i>	Fast Orientation mode processing times have been improved. This mode is best used for the quickest way to arrive at point clouds and orthophotos. When working with large image groups over 1 Gigapixel, this mode should be used.
<i>BLK3D IMAGES</i>	Generating point clouds from BLK3D images is improved with optimized 3d reconstruction and noise filtering that deliver cleaner point cloud results. Remember for any image group you want to generate point clouds from and combine in your project, after running the Orientation step add common control points and optimize the image group.



## 21 SERVICES: DOWNLOAD GNSS DATA SERVICES

*EARTH SCOPE*



UNAVCO and IRIS earth data services have merged to EarthScope Consortium. With this change there is an update for how users access free to use GNSS related data. Use the link under Services Earth Data to create an account on the EarthScope site, then provide your credentials to connect and access free to use GNSS data for downloading directly from the GNSS download manager in Infinity.

## 22 GENERAL APPLICATION IMPROVEMENTS AND FIXES

<i>POINT AVERAGING</i>	Additional option to let users include points computed from applications such as from COGO or offset points, in the point averaging computation.
<i>IMAGING</i>	To better manage display of images in the graphic view, new Survey Layers are added for each of the images types that are supported in a project. Choose to turn on or off Aerial, Terrestrial and Panoramic image frustrums.
<i>IMAGING</i>	Added a setting to resize the image frustrum to help make viewing images with other project data easier.
<i>IMAGING</i>	Fix for pixel size holes in the Orthophoto.
<i>IMAGING</i>	Fix for importing DJI Mavic M3E images, no matter the suffix used with naming image files, all files are now imported correctly.
<i>IMAGING</i>	Improved Orthophoto generation when no changes to the DPC dense point cloud have been made.
<i>SHIFT ROTATE SCALE</i>	Fix for cases when offsets used with linework, that the offset points are also updated.
<i>SURFACES</i>	Fix for live update of surfaces when measured points are added or removed, the surface is not updated automatically.
<i>INSPECTOR COLUMN FILTERS</i>	Fix for using filters in the Inspector columns, it could be that the filter only worked on first query but now works on any update to a query, not needing to reopen the filter box.
<i>ADJUSTMENTS</i>	Fix when applying and fixing control when two or more same point instances existed in the project, now the point held fixed is correctly shown in control points list.