- when it has to be **right**

Leica Geosystems
Release Notes

Product   Leica Infinity

Date   20th December 2023

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Leica Infinity v4.1.2

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1 WELCOME TO INFINITY

LEICA INFINITY V4.1.2

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

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

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.
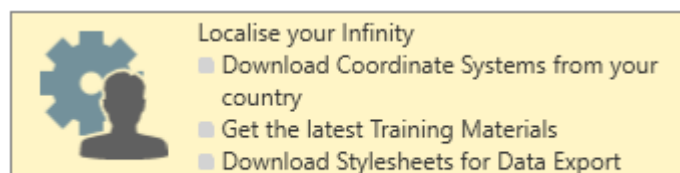
ORDERING INFINITY

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.

YOUTUBE VIDEOS

Check the Leica Infinity YouTube page to see our playlist of videos about new features and how-to-videos.

2 INSTALLATION DETAILS

| Leica Infinity v4.1.2	Build	Release Date:
	45684	22nd June 2023
Leica Infinity is available as a Windows 64bit only application		

INSTALLATION INFORMATION

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.
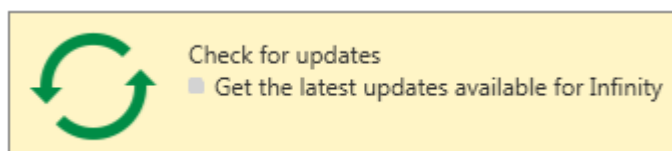
OPERATING SYSTEM REQUIREMENTS

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 INFRASTRUCTURE TUNNELING: NEW AS-BUILT PROFILES WITH OVER UNDER & VOLUMES
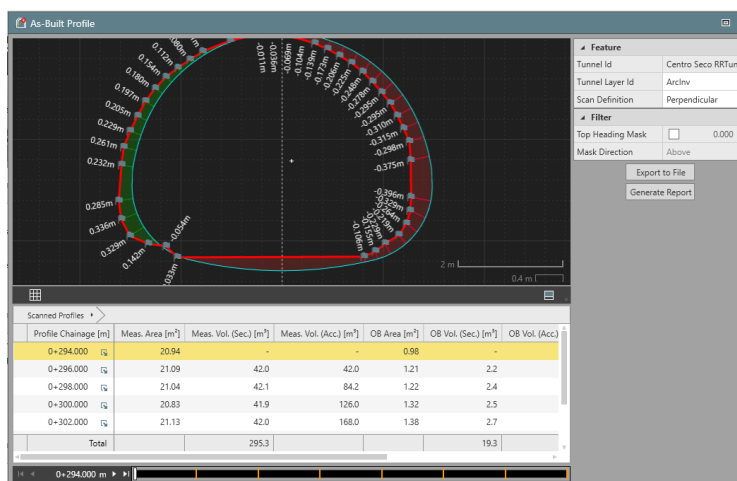
AS-BUILT PROFILES
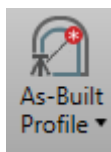
Using the Captivate Tunnel application users can import the results to Infinity and easily view measured data and create results for each profile compared to a tunnel design.

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.
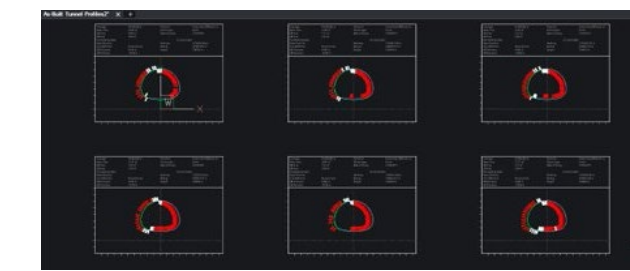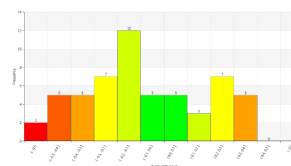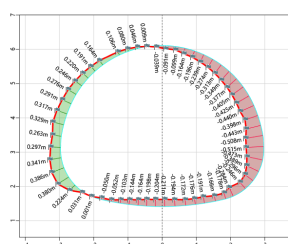

CREATE REPORT

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.
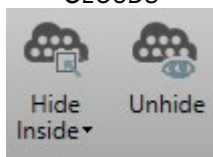Choose to Generate Report to save as PDF.


5

4 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.
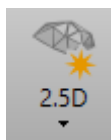
By selecting an area of the point cloud, using context menu or ribbon bar button, the user can assign data to be hidden.

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.
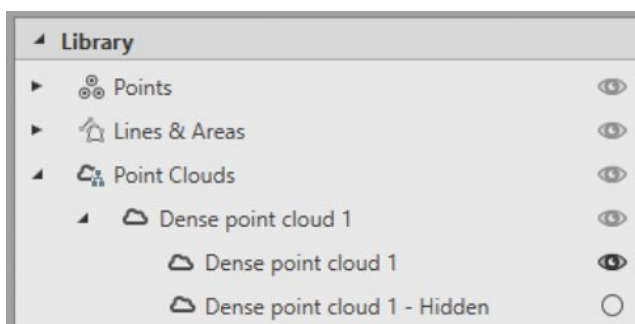
5 SURFACES: GENERAL IMPROVEMENTS

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.
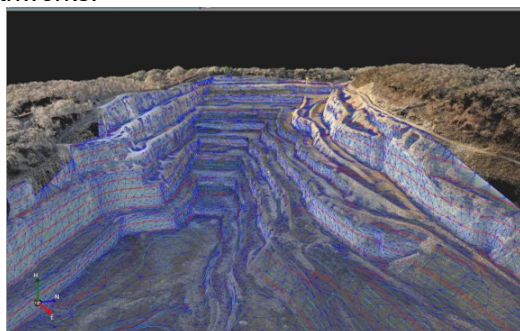
CUT SURFACE TOOLS
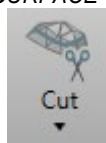
One of the time-consuming steps to good surface reconstruction is having the data reflect to real world objects, such as for boundaries or areas which should not be included in the mesh.
Now its possible to select a closed line or area feature and use it to cut the mesh. When working with stockpiles 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.

6 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.
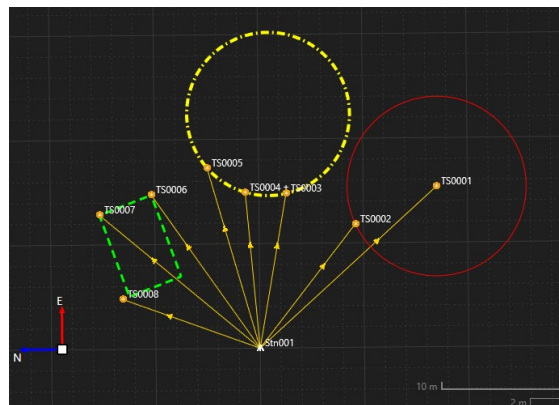
LINEWORK FLAGS

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.

7 GENERAL APPLICATION IMPROVEMENTS AND FIXES

GNSS	Performance improvements when processing large data sets greater than 36 hours and having all constellations and frequencies. Improvements in phase fix solutions in difficult and high multipath environments RTK rover points: users can again enter the individual accuracy settings considered for Network Adjustments
IMAGING	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. 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 dense point cloud (DPC).
IMPORT EXPORT	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. Importing DJI Matrice 3 with GNSS raw data logged, importing is now possible with a fix to address wrong GNSS time format. Export OBJ, PLY, gITF: Export surfaces in a format that includes texture. 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. 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
SERVICES	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.

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

GNSS	Fixed for baseline reports when the reference interval was shorter than the rover interval, the duration did not consider the reference interval. Added NGS 20 Absolute antenna calibration set.
IMAGING	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.
INFRASTRUCTURE	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. Improved the import of tunnel features imported by XML when different profiles were assigned to the same station. Fixed a crash when working with a tunnel feature that was imported from AMBERG. Fixed an issue for Tunnel Sections, in some cases the validation on section 1 would persist even if the data was valid.
POINT CLOUDS	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.
TRAVERSE	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. 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. 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.
RENAME TOOL	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.

9 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.

10 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.
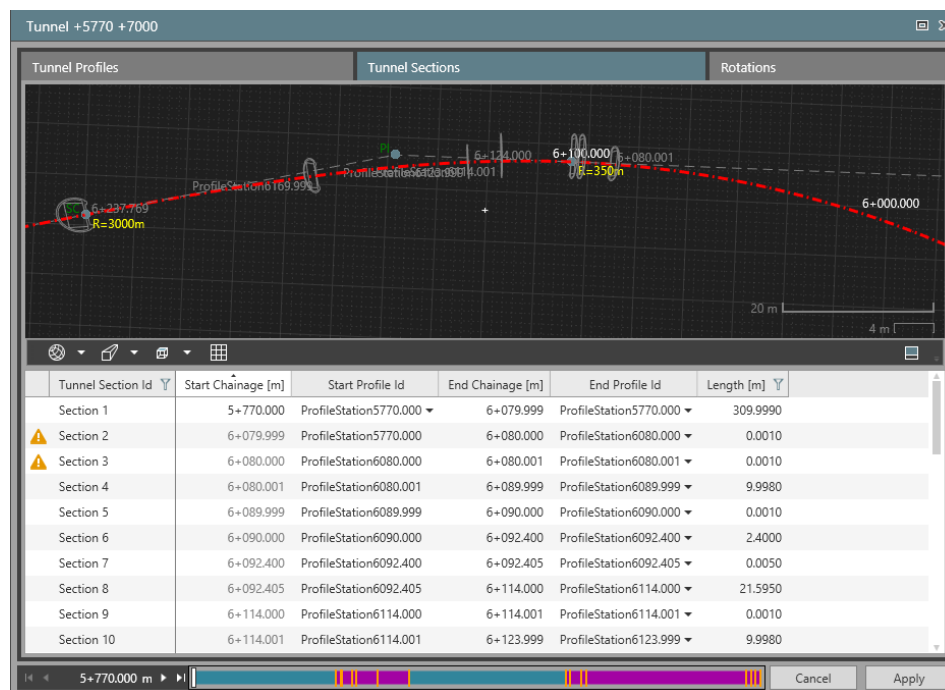
TUNNEL FEATURE

Tunnel

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

Tunnel Layer

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.
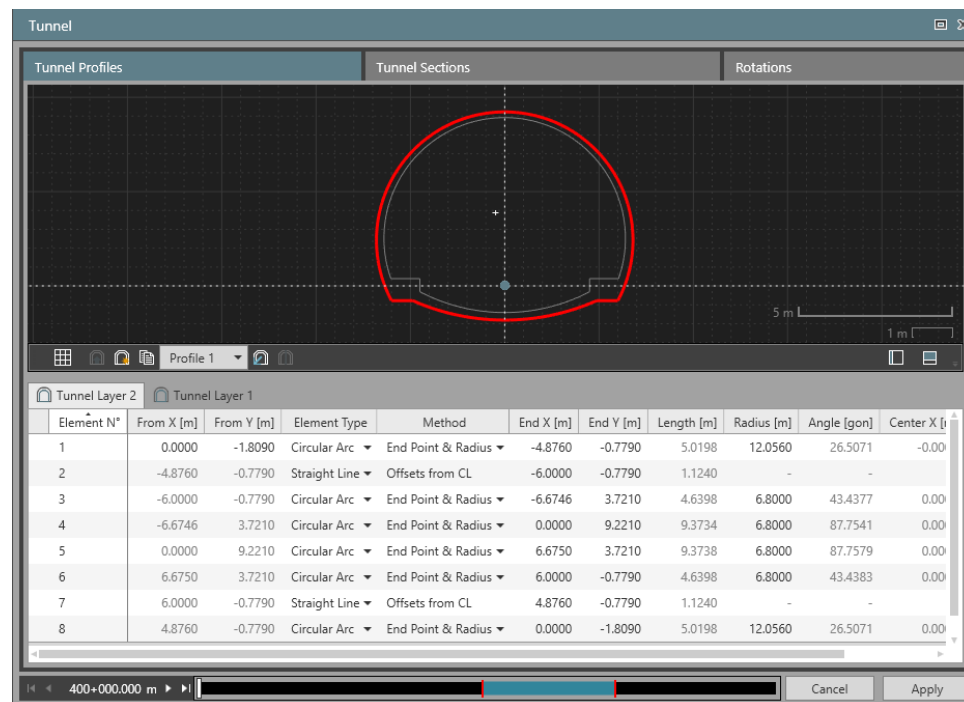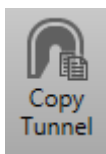

TUNNEL ROTATIONS

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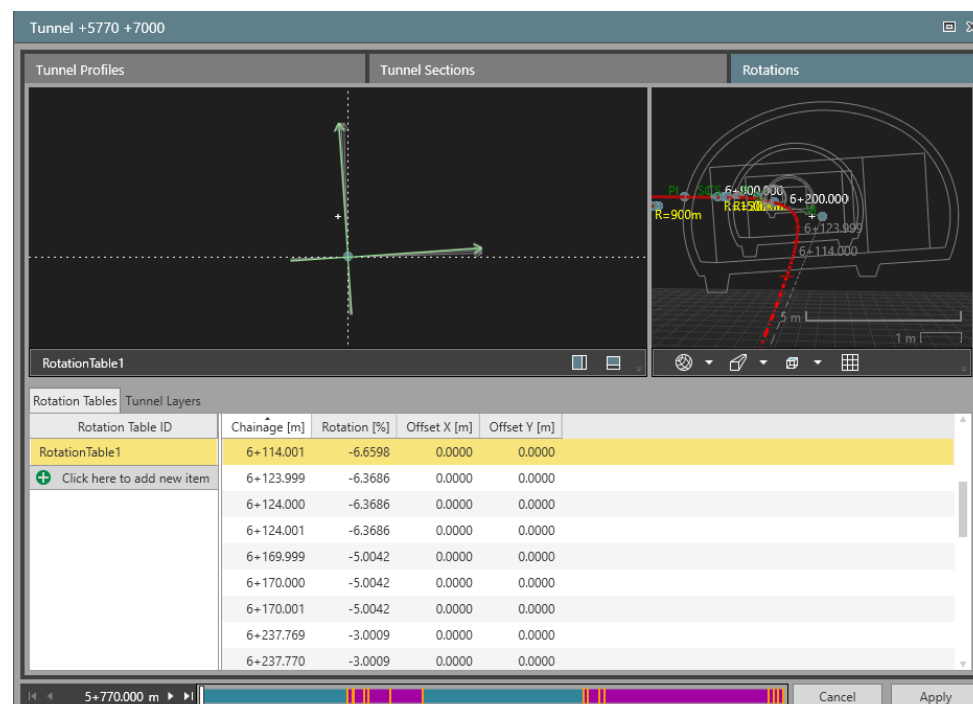
COPY TUNNEL

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	
◢ **Feature**	
Tunnel Id	Tunnel - Short Section
Date/Time	24/06/2023 08:49:08
Source	User-entered
◢ **Details**	
Tunnel Layers	5 ⓘ
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

Cancel   Create

11 IMPORT TUNNELS FROM CAD FILES
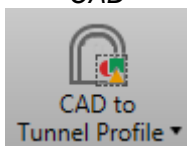
COPY TO CAD TO TUNNEL

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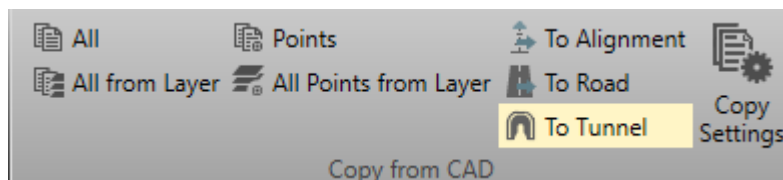
This creates a tunnel feature with the selected alignment. Add tunnel layers as required.

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.
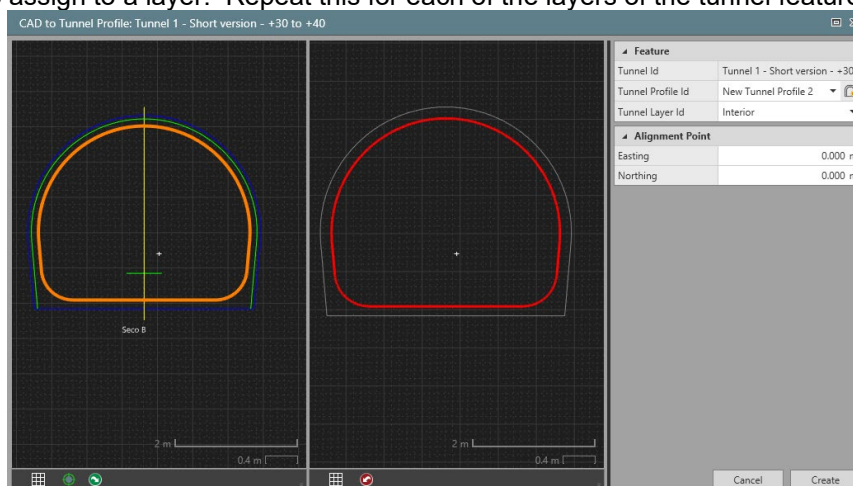
12 IMPORT TUNNELS FROM XML

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 asci 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.

13 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.

14 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.

15 IMAGING: POINT CLOUDS FROM IMAGES

PERFORMANCE IMPROVEMENTS	Leica Infinity 4.1 brings several improvements processing times and data outputs.
ORIENTATION: PRECISE MODE	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.
ORIENTATION: FAST MODE	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.
BLK3D IMAGES	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.
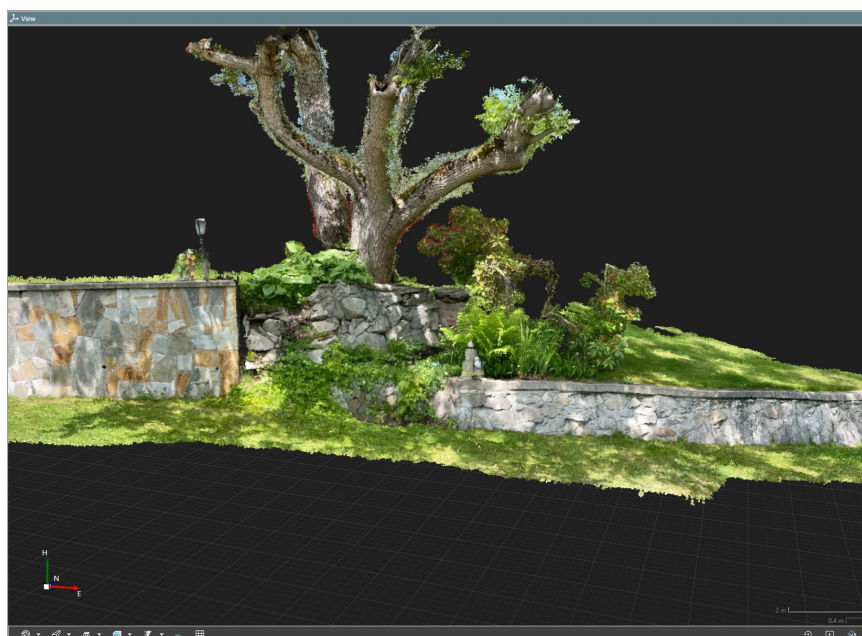
16 SERVICES: DOWNLOAD GNSS DATA SERVICES
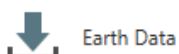
EARTH SCOPE ⬇ Earth Data	UNAVCO and IRIS earth data services have merged to EarchScope Consortium. With this change there is an update for how users access free to use GNSS related data. Use the link under Services Earth Data to create an account on the EarthScope site, then provide your credentials to connect and access free to use GNSS data for downloading directly from the GNSS download manager in Infinity.

17 GENERAL APPLICATION IMPROVEMENTS AND FIXES

POINT AVERAGING	Additional option to let users include points computed from applications such as from COGO or offset points, in the point averaging computation.
IMAGING	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.
IMAGING	Added a setting to resize the image frustrum to help make viewing images with other project data easier.
IMAGING	Fix for pixel size holes in the Orthophoto.
IMAGING	Fix for importing DJI Mavic M3E images, no matter the suffix used with naming image files, all files are now imported correctly.
IMAGING	Improved Orthophoto generation when no changes to the DPC dense point cloud have been made.
SHIFT ROTATE SALE	Fix for cases when offsets used with linework, that the offset points are also updated.
SURFACES	Fix for live update of surfaces when measured points are added or removed, the surface is not updated automatically.
INSPECTOR COLUMN FILTERS	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.
ADJUSTMENTS	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.