



# Trimble Business Center



## Working with Aerial Point Cloud Data in Trimble Business Center

### Introduction

This workflow document outlines the step-by-step procedure for working with aerial photogrammetry and LiDAR point cloud data using Trimble Business Center (TBC). Follow these instructions for efficiently importing, analyzing, and visualizing aerial data in TBC. Please note that TBC currently can't process raw LiDAR sensor data. However, it can run a photogrammetric adjustment (including camera calibration) to provide absolute orientation values for the camera position and angles for any manufacturer.

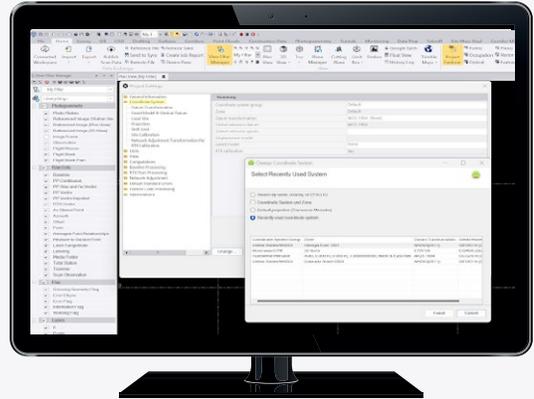
Find out more at:  
[www.trimble.com/tbc](http://www.trimble.com/tbc)



**STEP 1**

# Setting Up the Project

- 1 Open Trimble Business Center.
- 2 Create a new project and set the properties of the project to your requirements, for example:
  - **Project Type:** New Project
  - **Coordinate System:** e.g. UTM WGS 84 Zone 32N
  - **Change Coordinate:** e.g. CH1903+/LV95


**STEP 2**

# Importing Point Cloud Files into TBC

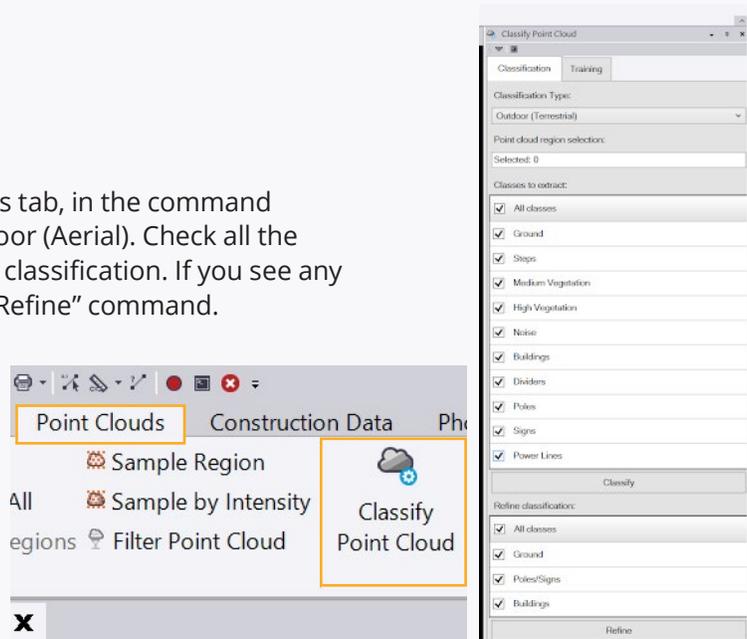
- 1 Open up the Import tool to select the files for the project. Another option is to utilize the drag-and-drop feature to import the downloaded LAS/LAZ files directly into TBC. Note: Ensure that the LAS files are in a location accessible for drag-and-drop.
- 2 During the import process, carefully choose the appropriate point cloud unit of measurement for accurate representation.
- 3 Opt for the "geo-referenced point cloud" option if the point clouds are already geo-referenced, if not select non-georeferenced. Then select "More Options" to tell the importer how the point cloud was geo-referenced for a more precise import.
- 4 If desired, use the "Advanced" settings to determine the center of the point cloud for additional specificity.
- 5 Complete the import process by confirming the inclusion of LAS files into the project.



**STEP 3**

# Classification

- 1 Select Classify Point Clouds in the Point Clouds tab, in the command window select the Classification type as Outdoor (Aerial). Check all the classes required and select “Classify” to begin classification. If you see any misclassifications in the point cloud, run the “Refine” command.

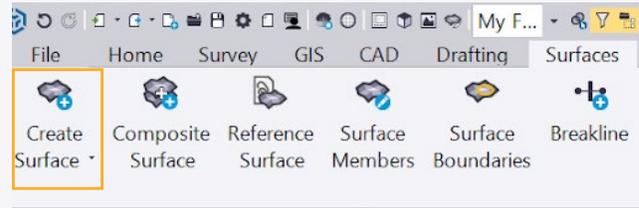

**STEP 4**

# Advanced Filtering

- 1 In the “Points Cloud” tab, select the Advanced Filtering tool. This will allow you to extract a new region based on elevation. For example, you could extract a “bare-ground” region that does not include low-lying grass and other vegetation, but instead includes only the lowest points in the cloud, at ground level. (Note: To ensure the best results when extracting a bare-ground point cloud region, you should first classify the ground-level points using the Extract Classified Point Cloud Regions command.) This can also be used just to simply sample down any point cloud region.
- 2 Select which regions are to be filtered and give the new region a name.
- 3 Set the specific filtering options for your dataset. The cell size, dynamic cell size, minimum significant elevation distance, and minimum dynamic cell size options can all be raised or lowered depending on the level of detail desired.
- 4 Select the outlier point filtering option to control the level of noise reduction.
- 5 The minimum elevation option for the filtering strategy parameter is the default and used for bare ground classification. However, maximum and average elevation options are added for additional filter customization.
- 6 Optionally, use the filter by polyline settings to use polyline(s) as a different method of applying this filter using horizontal and vertical offset options.
- 7 Click “Filter” and when the process is complete a newly extracted region will appear in the View Filter Manager and under the Point Cloud node in the Project Explorer.

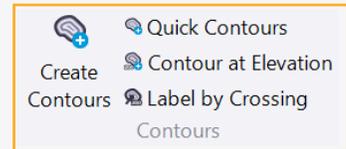
STEP 5

# Generating Surfaces



1 Surface Creation:

- The newly formed sampled region is now part of the Point Cloud Region.
- Select the region, proceed to the Surface tab, and opt for "Create Surface".
- Specify the surface name, classification, and color then click confirm.

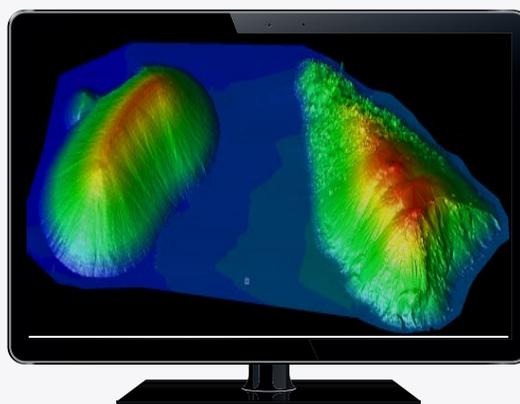
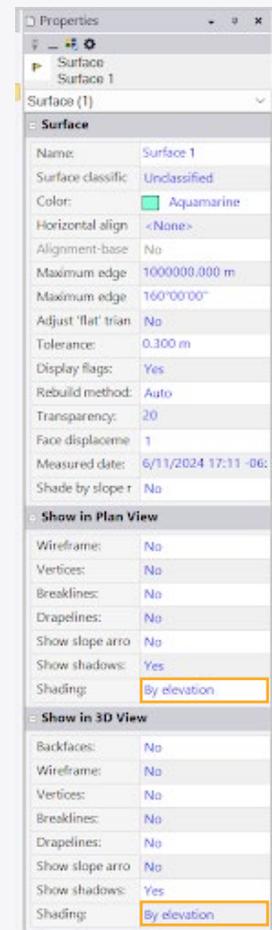


2 Surface Visualization:

- In the Project Explorer, locate the surface and adjust the Shading property to "By Elevation" for better visualization.

3 Contour Generation:

- Right-click on the surface and choose "Create Quick Contours" to initiate standard contour generation.
- Alternatively, click on Create Contours to control the contour parameters such as contour interval, frequency, line weight, color and more for a more customizable workflow.

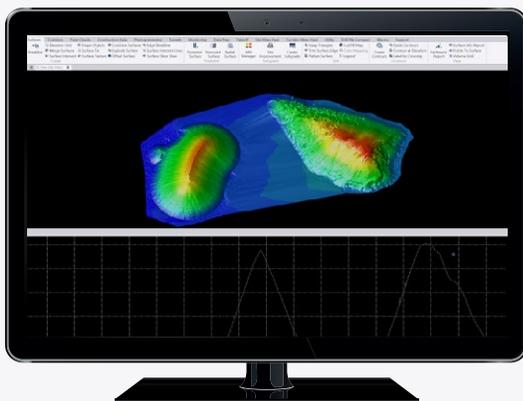
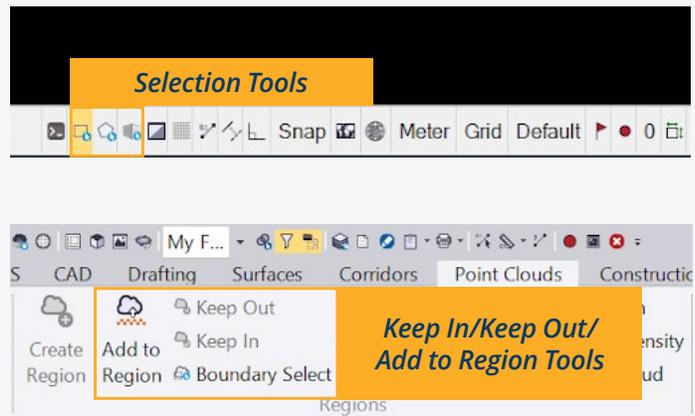


**STEP 6**

# Editing and Viewing the Points Cloud data

In the Trimble Business Center (TBC) workflow for editing point classes, the process begins after the classification of point clouds, where each class gets assigned to a specific region. To reclassify or adjust these classifications:

- 1 **Selection Process:** Utilize the selection tool within TBC to choose the specific area or individual points that require reclassification.
- 2 **Isolation with Keep In Tool:** Employ the Keep In tool to isolate the selected points, allowing focused attention on the points to be reclassified.
- 3 **Reassignment using Add to Region Tool:** With the Add to Region tool, reassign the selected points to a new region or a different class as required.
- 4 Explore the 3D view to visualize contours and surfaces.
- 5 Use the Surface Slicer for cross-sectional analysis.



## STEP 7

## More Deliverables

Trimble Business Center (TBC) offers several production workflows for working with point cloud data. These workflows include:

- ① **Point Cloud Registration:** Aligning multiple point clouds to create a unified dataset.
- ② **Point Cloud Classification:** Categorizing points based on their attributes (e.g., ground, vegetation, buildings).
- ③ **Feature Extraction:** Identifying and extracting specific features from the point cloud data. Extracting line features like lane lines and power lines, point features like trees, poles and signs, curb & gutter, stockpiles and other CAD objects from point clouds.
- ④ **Volume Calculation:** Computing volumes for earthworks and other applications. The “Stockpile Extraction” command can be used to quickly calculate volumes for stockpiles.
- ⑤ **Surface Modeling:** Creating and editing surfaces from point cloud data.
- ⑥ **Surface and Contour Creation:** Generating surfaces and contour lines from point cloud data.
- ⑦ **Mesh Generation:** Producing 3D meshes from oblique imagery for detailed surface representation and they can be exported as CAD files.
- ⑧ **Inspection and Analysis:** Conducting inspections and analyses such as deformation monitoring and quality control.
- ⑨ **Visualization and Measurement:** Visualizing point clouds in 3D and performing measurements.
- ⑩ **Cross-Section and Profile Creation:** Generating cross-sections and profiles from point cloud data.
- ⑪ **Drawing and Annotation:** Adding CAD drawings and annotations directly onto the point cloud data.

These deliverables can be exported in various CAD formats such as DWG, DXF, and others.

Contact your local Trimble Authorized Distribution Partner for more information

**NORTH AMERICA**  
Trimble Inc.  
10368 Westmoor Dr  
Westminster CO 80021  
USA

**EUROPE**  
Trimble Services GmbH  
Am Prime Parc 11  
65479 Raunheim  
GERMANY

**ASIA-PACIFIC**  
Trimble Navigation  
Singapore PTE Limited  
3 HarbourFront Place  
#13-02 HarbourFront Tower Two  
Singapore 099254  
SINGAPORE