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So you have received LIDAR data and you really need to classify all those buildings in a timely fashion. The LP360 **Planar Point Filter** is an automatic process for classifying planar surfaces such as buildings.

Located in the **Point Cloud Task** tab of the Table of Contents window of LP360, you can quickly set up a custom filter for this process. (Figure 1)

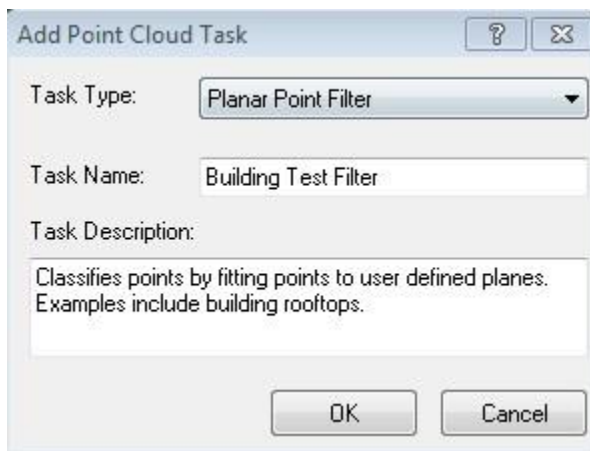


Figure 1

Once you have your Point Cloud Task, in this example “Building Test Filter” created, there are several parameters that will need to be set. However, before you set those parameters there are a couple of things to be aware of. In order for the planar point filter to work correctly, the ground needs to be classified. Since the ground is largely a planar surface, it must be classified to remove those points from consideration.

Secondly, there is often planar noise near buildings such as automobile roofs, decks, etc. To remove these points from being considered as building points, you need to set a height filter. To use the height filter, ground must be classified.

See below for an explanation of the Planar Point Filter parameters (Figure 2).

Tools, Tips, and Workflows

Automatic Building Classification from LIDAR

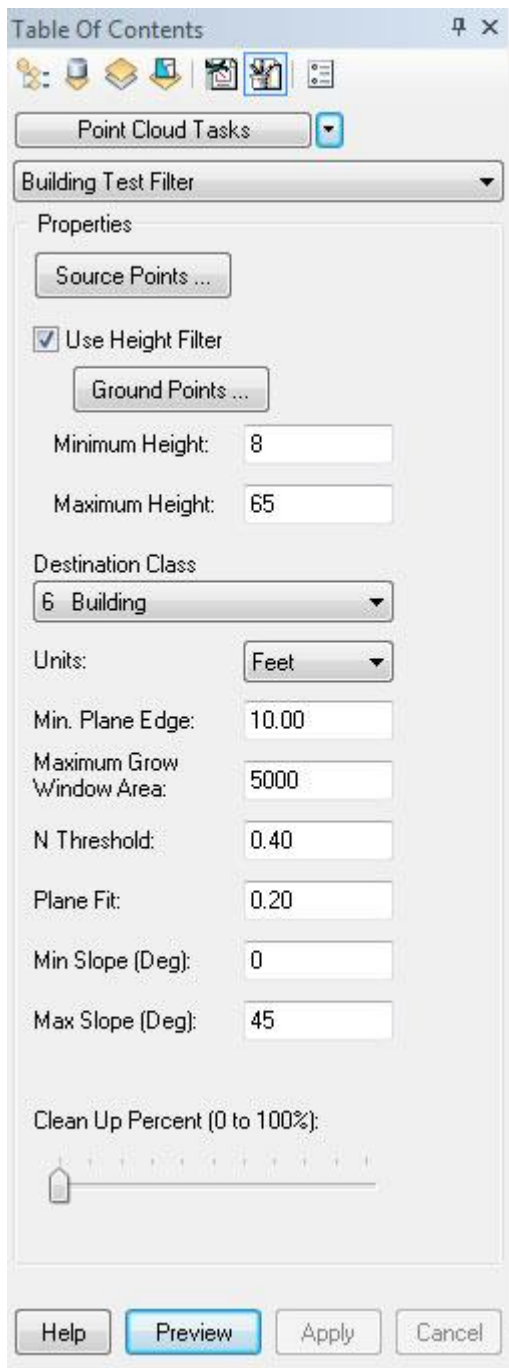


Figure 2

Source Points – Define the points to be considered for classification. Typically, buildings will be unclassified, last return points.

Ground Points – The points that act as the ground class. Selecting a minimum height allows you to weed out points below a common building height. This helps remove vegetation, cars and other unwanted planes.

Minimum Plane Edge – Needs to be roughly $\frac{1}{2}$ the distance of the minimum edge of the buildings that need to be classified. Represented by the red line in Figure 3.

N Threshold – Sets the distance to consider a point as part of the plane. This removes outlying points from consideration. Blue line in Figure 4.

Plane Fit – This will be the tightness of the fit of the planar surface. Red line in Figure 5.

Slope – This is looking for the actual slope of the roof planes. Take into account the possibilities of flat roofs.

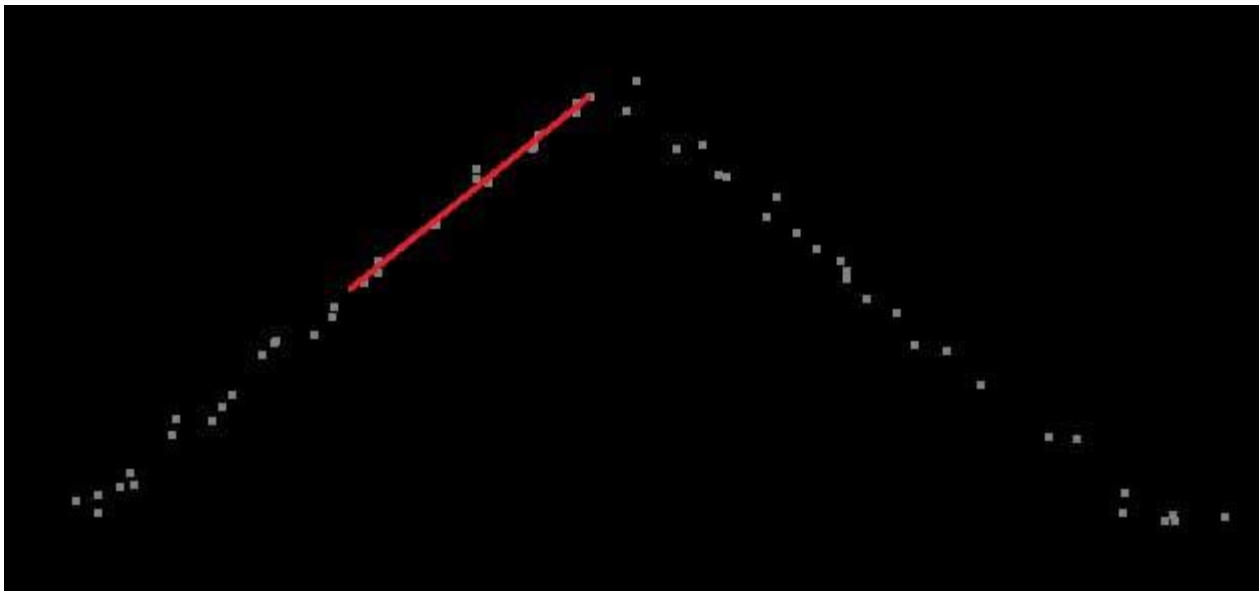


Figure 3

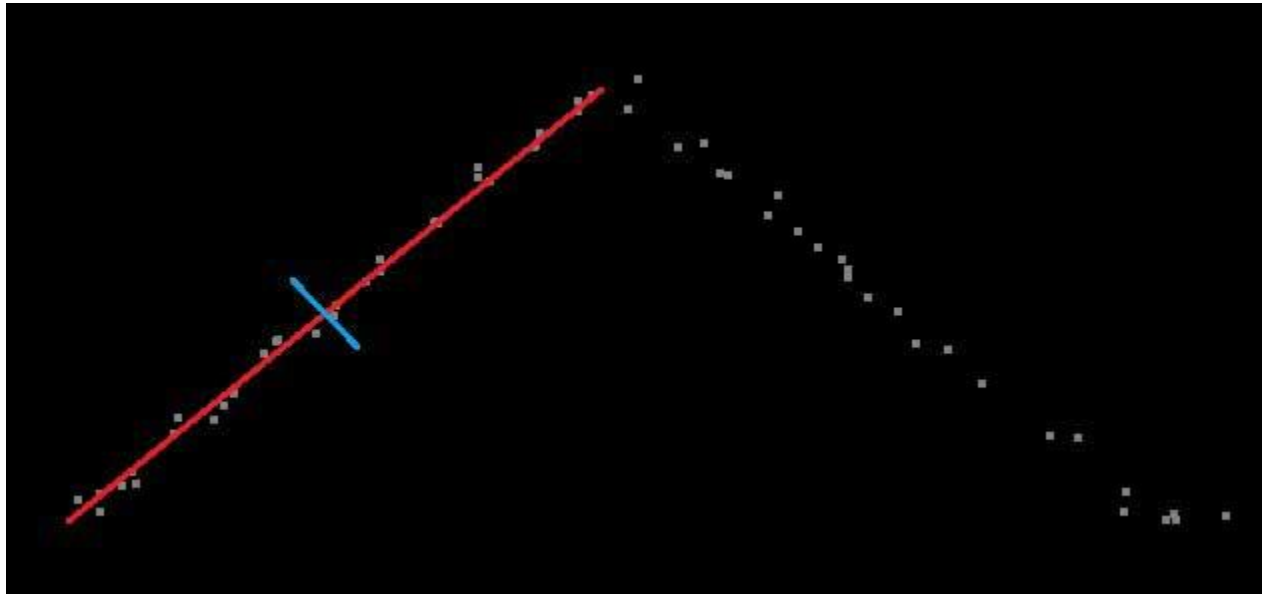


Figure 4

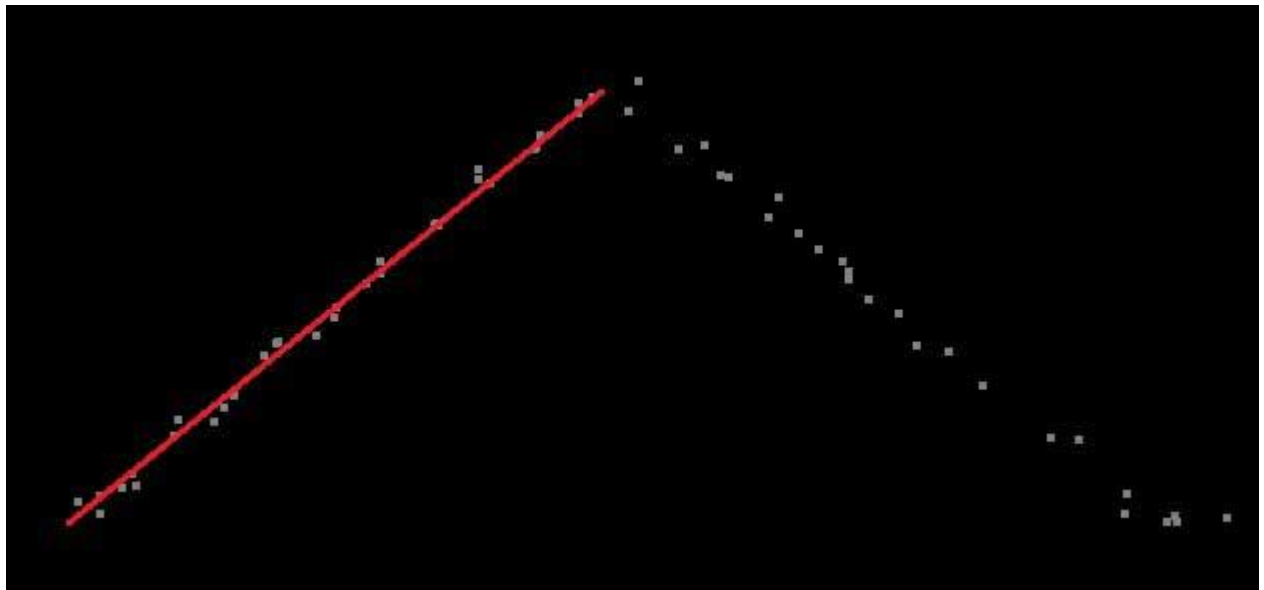


Figure 5

Each time the parameters are changed, be sure to click the “Apply” button at the bottom of the dialog. Once the parameters have been set, the **Preview** option (located at the bottom of the window) allows you to test these parameters on sample areas. This gives you the ability to go back and alter the values before you run this filter on the entire project.

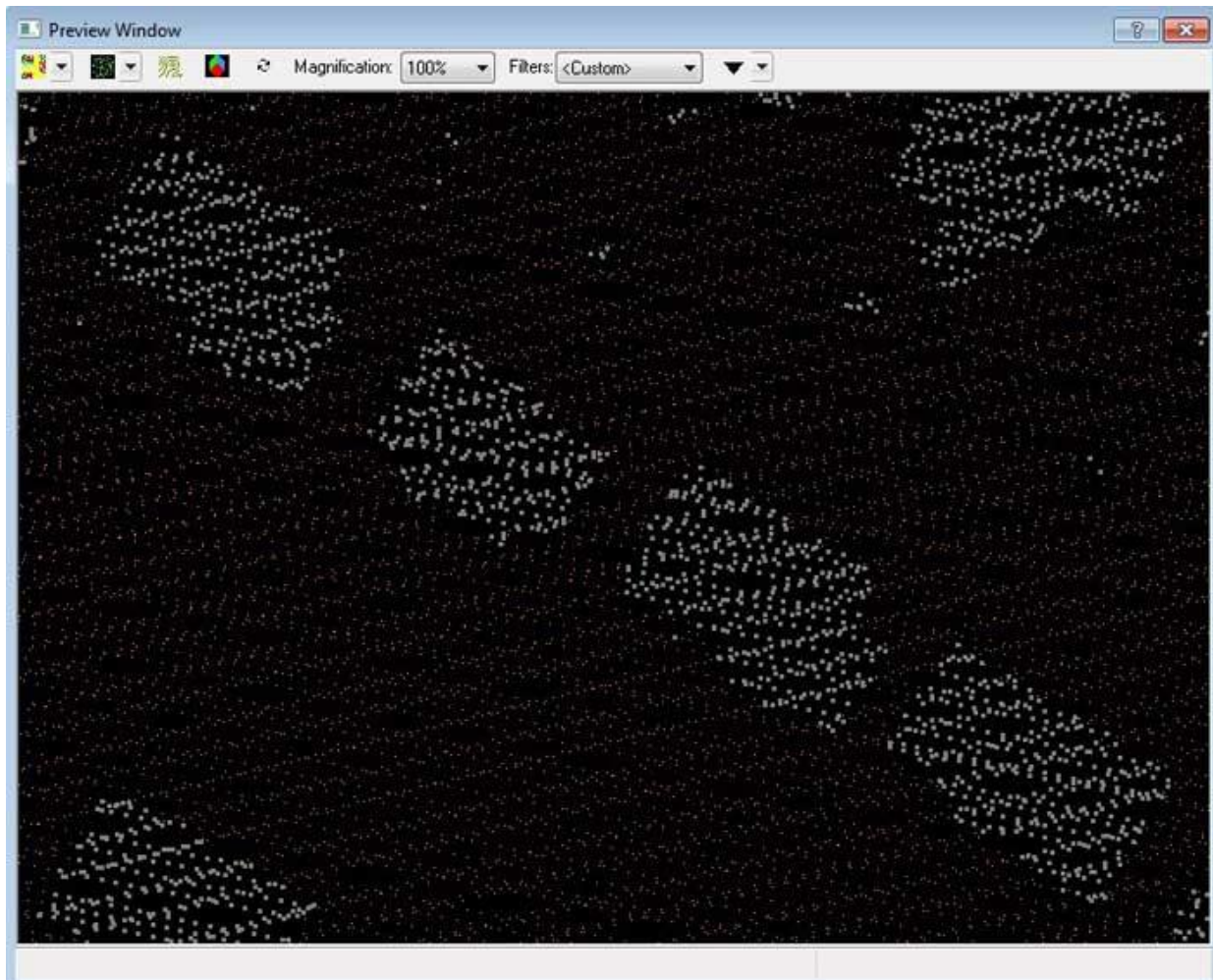


Figure 6: The previewed area displayed by classification before the task has been executed.

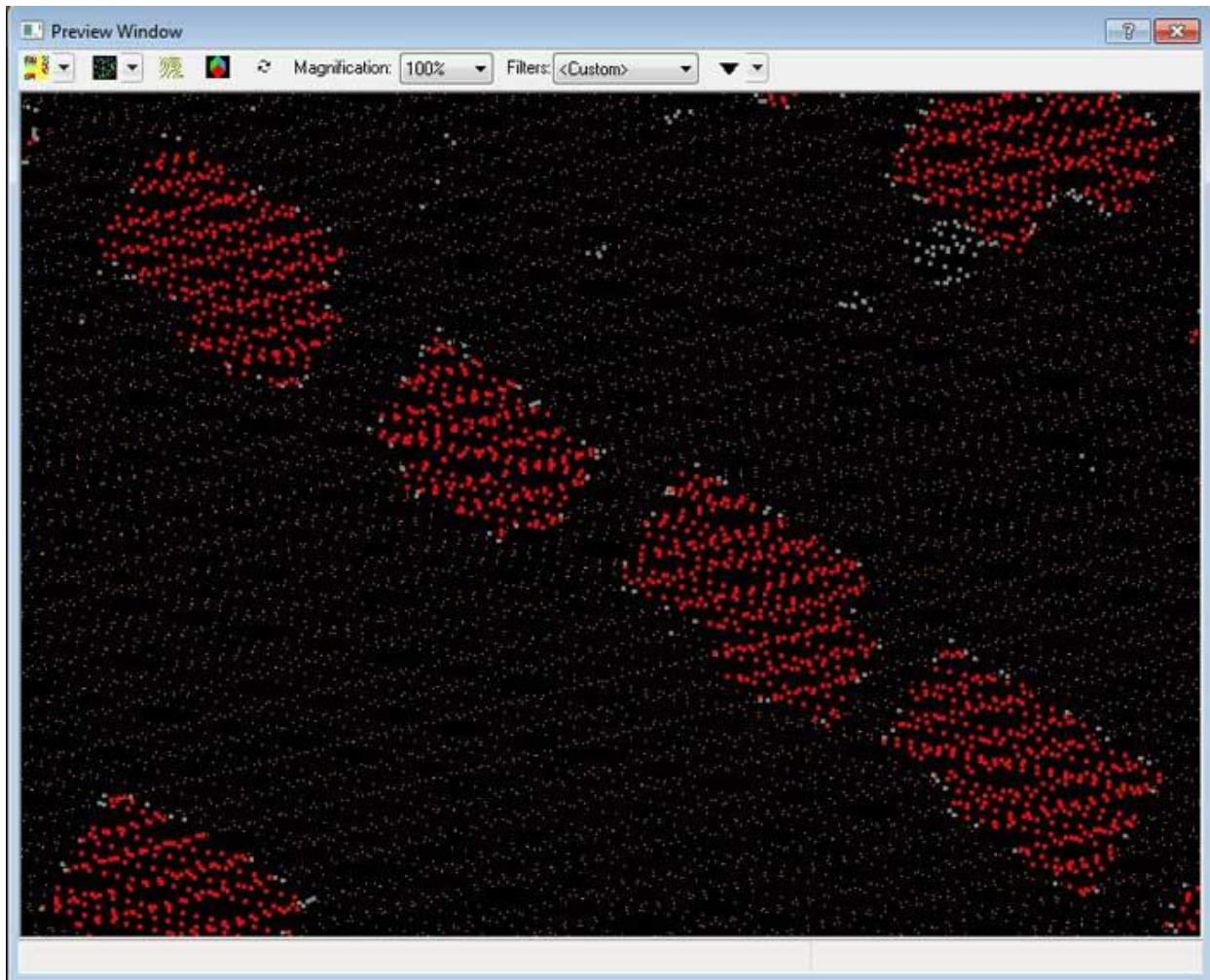
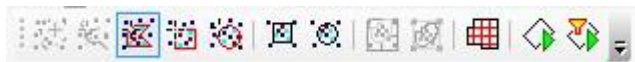


Figure 7: The results of the same area after the task has been executed.

After establishing the best parameters for the data, use the LP360 Point Cloud Task tool bar to run the task on a custom area or the entire project (Figure 8).



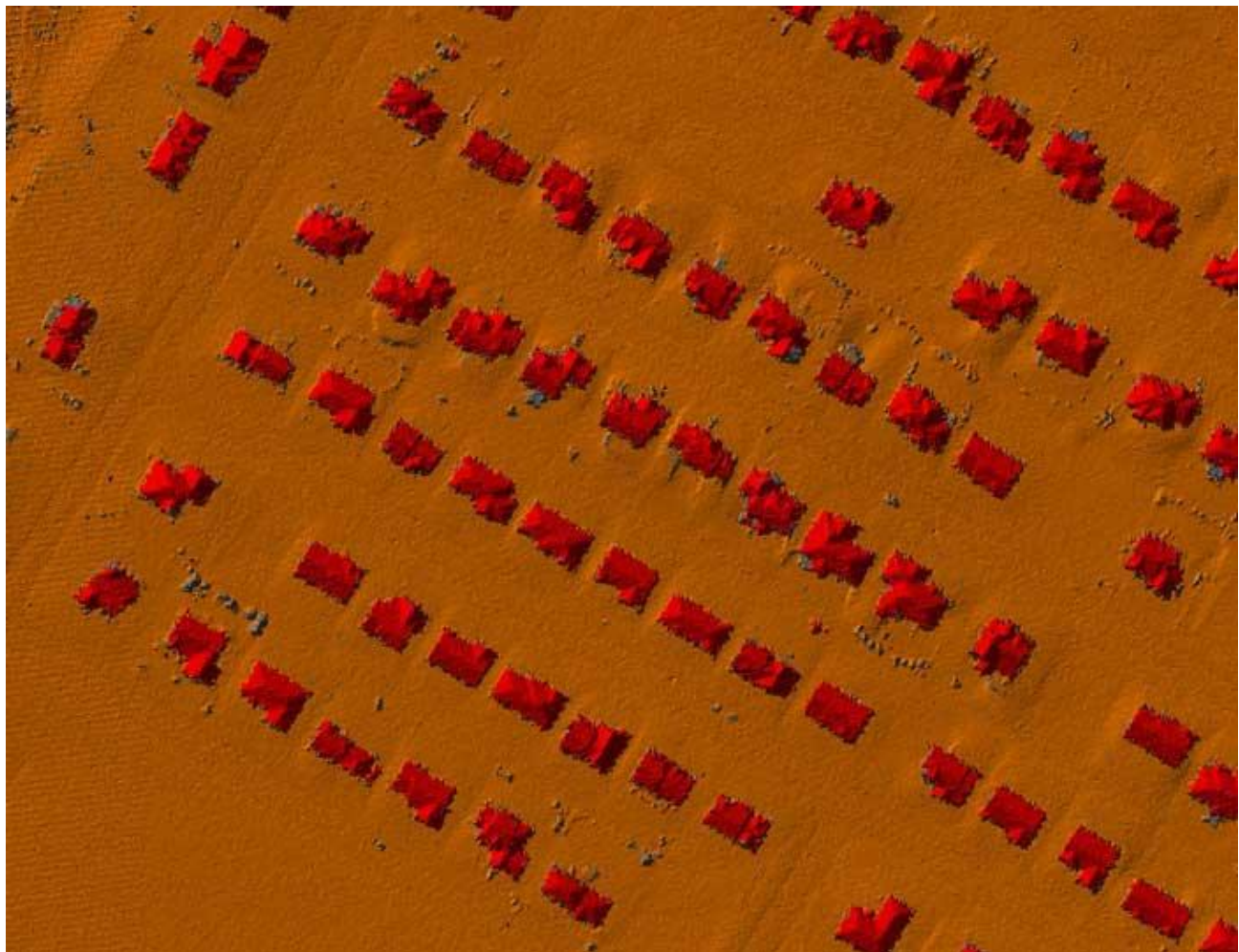


Figure 8: Buildings classified using the LP360 Planar Point Filter

Understanding the Planar Point Filter will allow you to quickly fine-tune the Point Cloud Task to accurately and successfully classify buildings.

Things that can affect the results of the Planar Point Filter:

Flightline Overlap: In areas of overlap, which can be displayed by Point Source ID, (Figure 9), you may need to adjust your Planar Point Filter parameters to account for the difference in point density between the overlap and non-overlap areas.

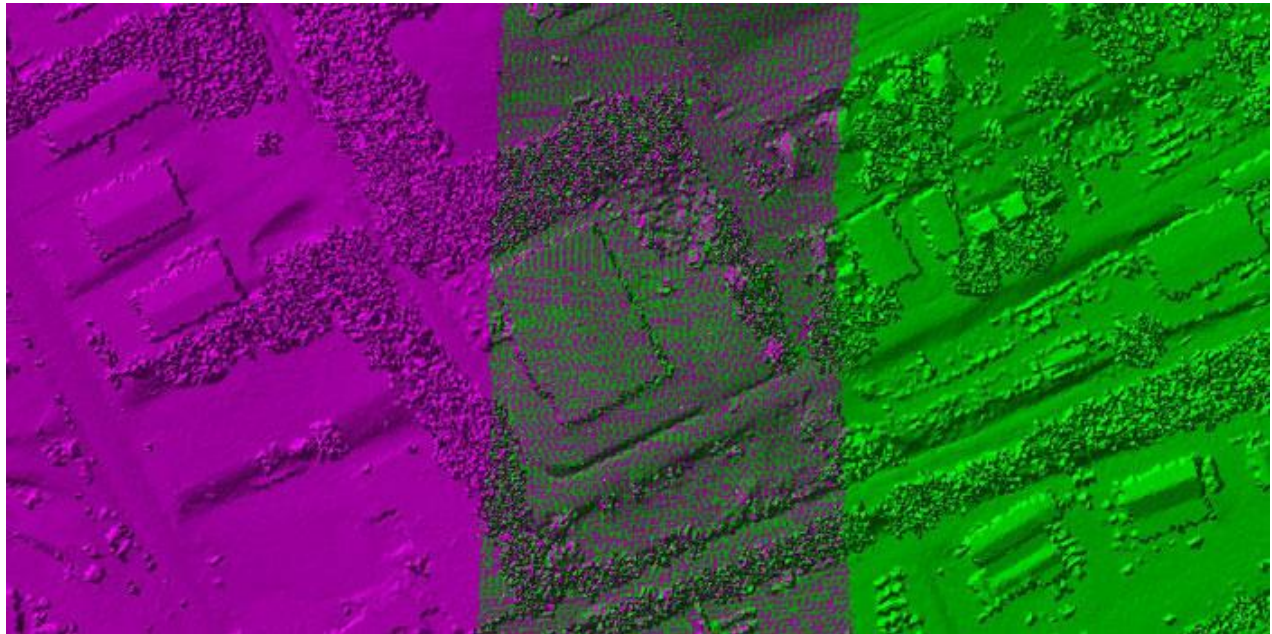


Figure 9

Flightline Alignment Calibration Issues: The Hillshade and DEM (Figure 10) demonstrate a flightline alignment issue that would prevent the Planar Point Filter from accurately classifying the buildings.

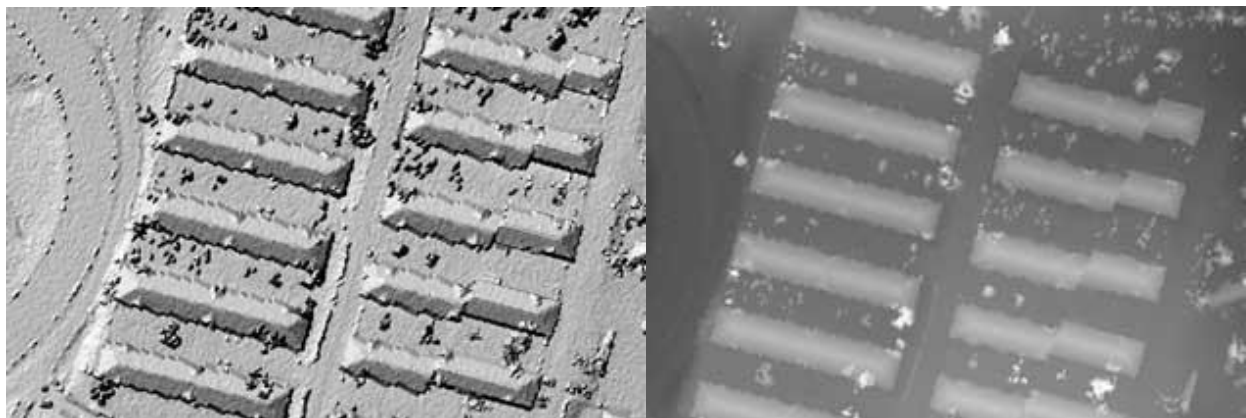


Figure 10