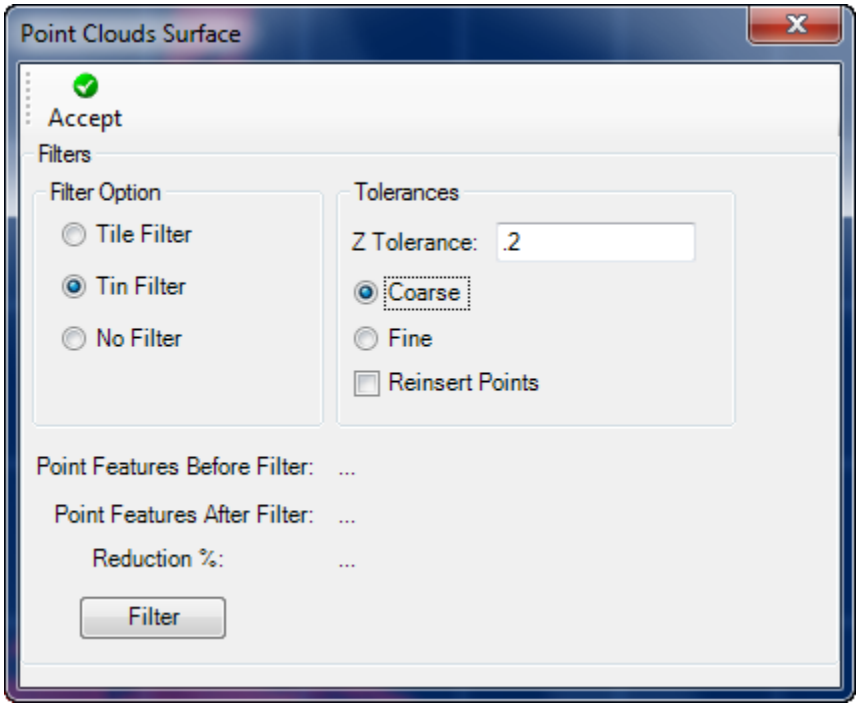
Results of Testing

j6i2423a.pod = 82 million points (1.05 gb)

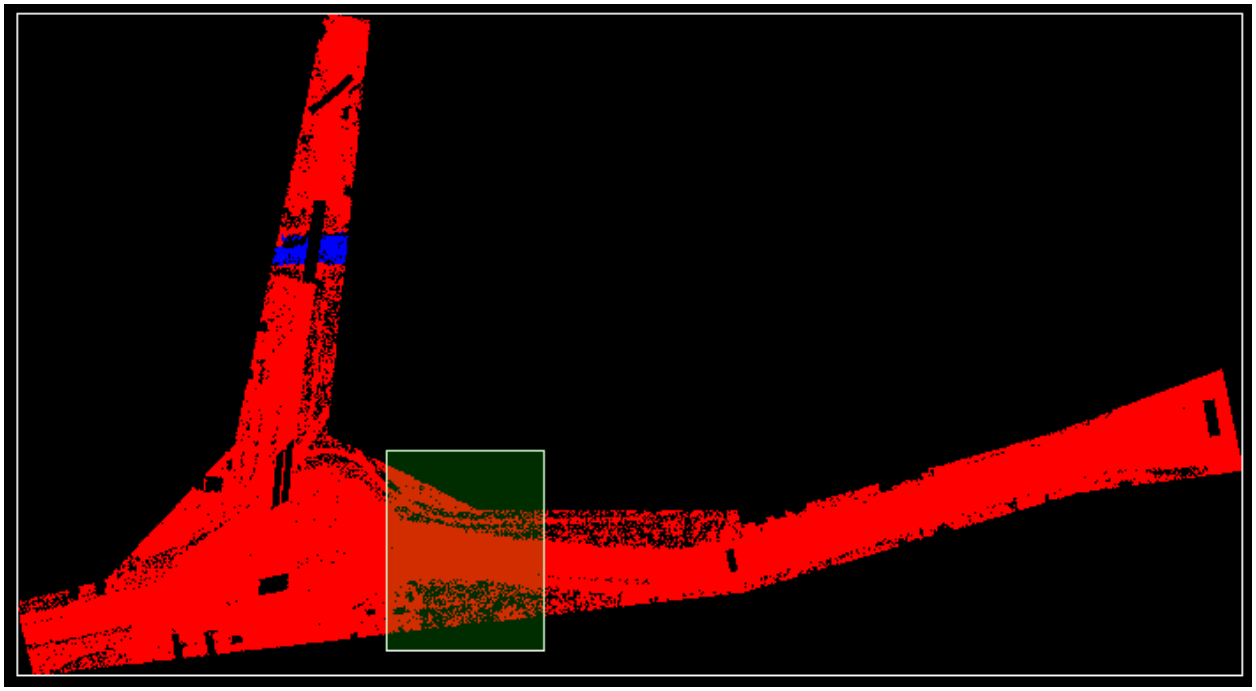


This first area of testing was to see what results different Z Tolerance would give us.

All tests run with *Tin Filter* using *Coarse* option enabled.

Z Tolerance	Reinsert Points	Points After Filter	Reduction %	TIN Size
.1 (1.2”)	No	10,664,393	87%	1 gb.
.15 (1.8”)	No	4,027,806	95%	377 mb
.15 (1.8”)	Yes	5,542,215	93%	519 mb
.2 (2.4”)	No	2,361,096	97%	221 mb
.2 (2.4”)	Yes	3,125,816	96%	293 mb
.25 (3”)	No	1,877,073	98%	176 mb
.25 (3”)	Yes	2,435,192	97%	228 mb
.3 (3.6”)	No	1,681,224	98%	157 mb
.3 (3.6”)	Yes	2,146,369	97%	201 mb

Since I could not build an Unfiltered TIN of the entire project, I specified a small area (see image below). This was more for curiosity's sake.



All tests run with *Tin Filter* using *Coarse* option enabled, Re-Insert Points option disabled. Area filtered was inside of FENCE as shown.

Z Tolerance	Reinsert Points	Points After Filter	Reduction %	TIN Size
None	N/A	7,486,700	0%	700 mb.
.15 (1.8")	No	398,241	94%	37 mb
.20 (2.4")	No	202,077	97%	19 mb
.30 (3.6")	No	126,741	98%	12 mb

Recommendations:

1. **Always use *TIN Filter* option**

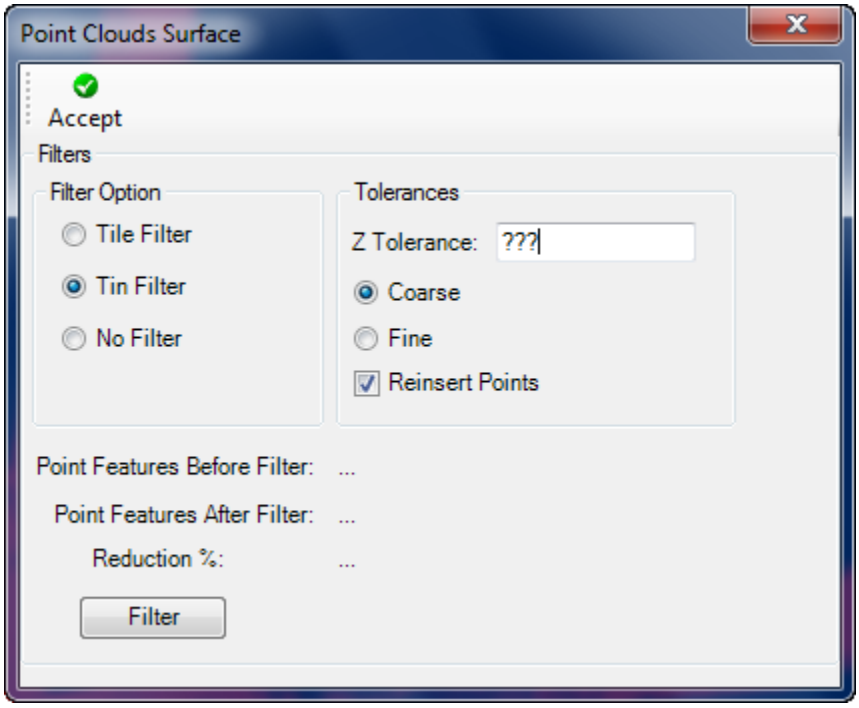
   Much slower than Tile option, but gives 90% + reduction rates while maintaining TIN accuracy within desired values.

2. **Always use *Coarse* option**

   The Fine option doesn't do much … Coarse option is much better.

3. **Always use *Re-Insert Points* option**

   After all the points are filtered out, a 'final' TIN is built from the remaining points. At this point in the process, all of the discarded points are draped on this 'final' TIN … any discarded points that fall outside of the vertical tolerance are added back in and the TIN is rebuilt. This is a safety measure, allowing the re-inserting of points that may have been mistakenly removed.



Finally, we look at what Vertical Tolerance should be used.

Z Tolerance	Reinsert Points	Points After Filter	Reduction %	TIN Size
.15 (1.8")	Yes	5,542,215	93%	519 mb
.2 (2.4")	Yes	3,125,816	96%	293 mb
.25 (3")	Yes	2,435,192	97%	228 mb
.3 (3.6")	Yes	2,146,369	97%	201 mb

In the job in question, the acceptable vertical error within the roadbed is .3.

0.3 ft @ 95% confidence (H/V) and max. point spacing of 0.3 ft within the roadbed (pavement calculations)
0.5 ft @ 95% confidence (H/V) and max. point spacing 1 ft for Urban Corridors (Earthwork)
0.5 ft @ 95 confidence (H/V) and max. point spacing 2 ft Rural Corridors (Earthwork)

As such, if you want to be absolutely sure that your final filtered TIN is within .3 feet of your original unfiltered TIN, then you should you ½ of the acceptable vertical error (.3). In other words, .15.

However, in keep in mind that this .3 is the "maximum" error but is not common. In fact, in our testing, using a Vertical Tolerance = .3 (which could result in a max error = .6) gave a very accurate TIN. Below is an Elevation Difference schematic between the original unfiltered TIN and a TIN filtered using a Vertical Tolerance = .3. Note the very small differences.