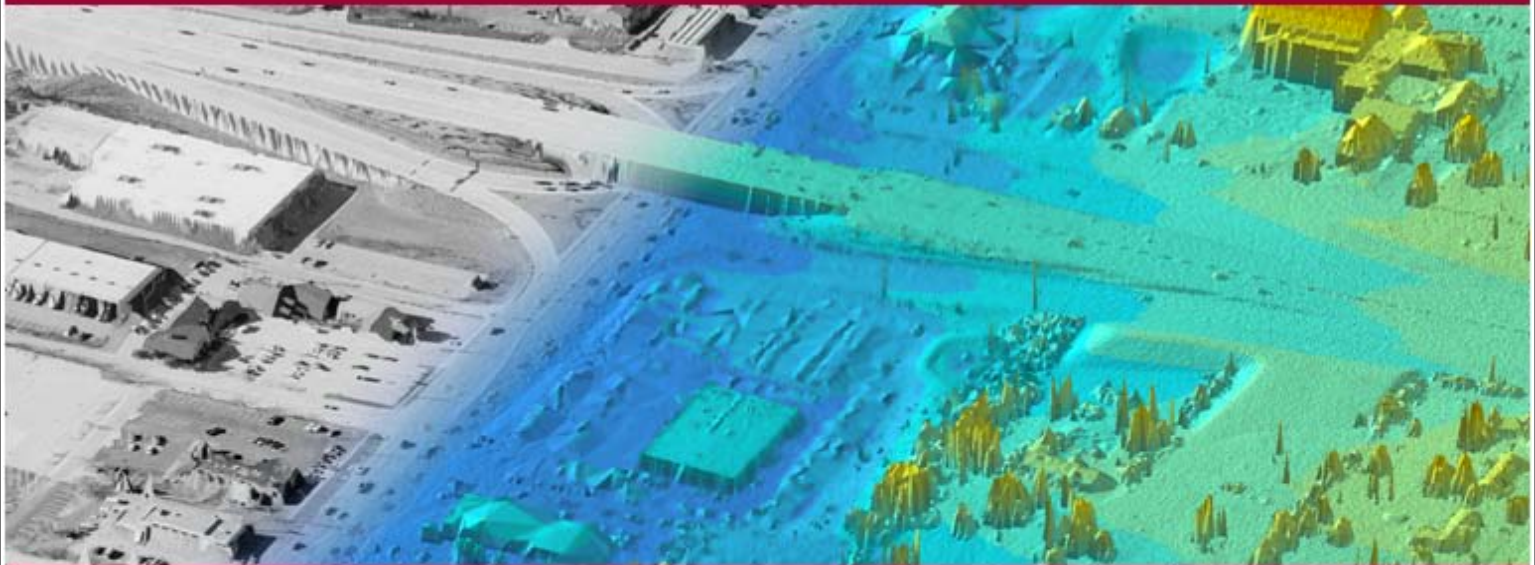


# LiDAR ACCURACY REPORT

**Project:** Missouri Counties LiDAR Project  
**Report Area:** Howard County, MO  
**Delivery Order No.:** 0007  
**Contract No.:** W912P9-10D-0538  
**Date:** 12-December-2012  
**Submitted by:** Wade Williams, Project Manager



**US Army Corps of Engineers, St. Louis District**



## Howard Co. Swath LiDAR Control

The field survey for this delivery consisted of 10 hard surface (HS) control points used for calibrating the unclassified LiDAR swath data. The graphic below presents these control points on the delivery area map.

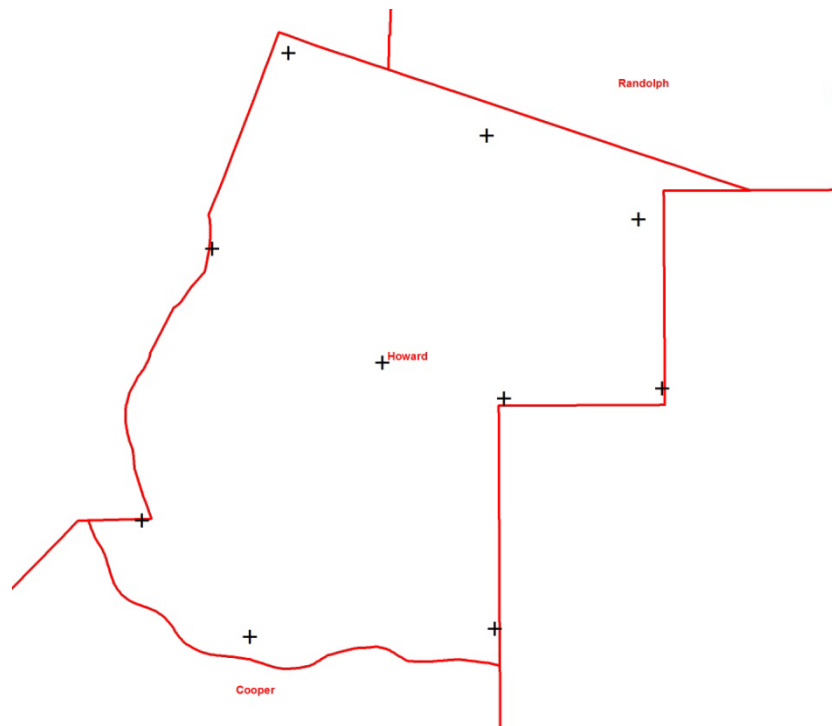


Figure 2 Howard Co. Swath LiDAR Control

## Swath LiDAR Control Accuracy Results

The table below presents the results of the control accuracy analysis for the Howard Co., MO unclassified swath LAS data. All values are in meters.

Stat	Hard Surface (HS)
Count	10
RMSEz (FVA)	0.056
95% Confidence Level (FVA)	0.110

### Howard Co. LiDAR QC Check

An additional set of survey points were collected for an independent QC of the Classified LAS & ESRI Grid deliverable tiles. The points were collected over the following feature types: 32 hard surface (HS), 32 grass (G) points & 30 tree (TR) points for a total of 94 qc check points. The graphic below presents these QC check points on the delivery area map.

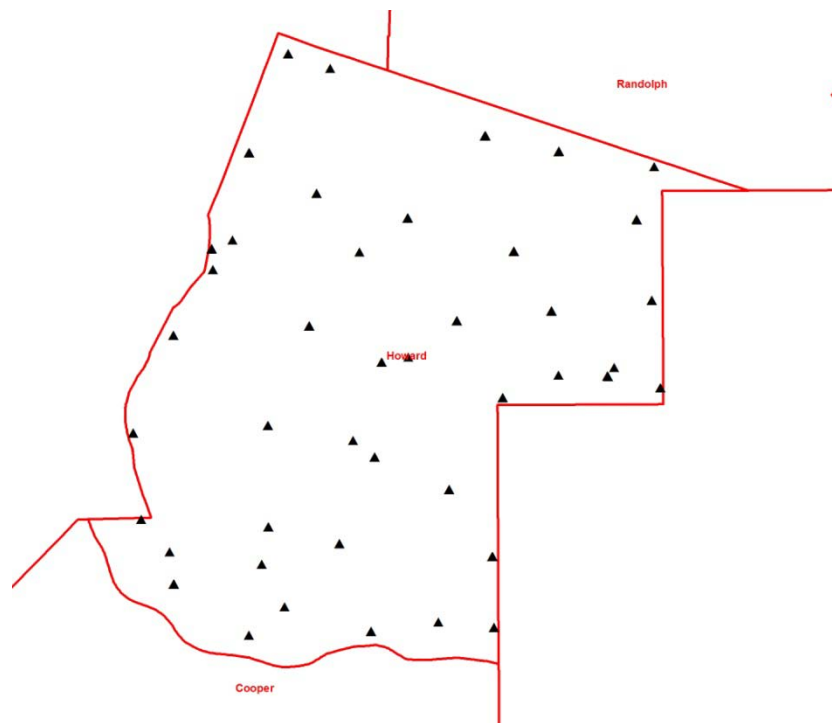


Figure 3 Howard Co. LiDAR QC Check

These points consisted of various types of ground cover including asphalt, gravel, short grass, tall grass and trees. Examples to the types of points surveyed are included below.





The required LiDAR elevation data values were derived within ArcGIS from the bare earth LAS files. For each control point location a LiDAR elevation value was derived and exported and the surface value subtracted from the survey elevation. These derived values were imported into Excel and comparisons were performed to generate statistics by ground cover type and for the overall dataset.

## Classified LAS QC Accuracy Results

The table below presents the results of the QC accuracy analysis for the Howard Co., MO classified LAS tile data. All values are in meters.

Stat	Overall	Hard Surface (HS)	Grass (G)	Trees (TR)
Count	94	32	32	30
RMSEz (FVA)	0.069	0.072	0.066	0.069
95% Confidence Level (FVA)	0.135	0.141	0.129	0.135
95 <sup>th</sup> Percentile (CVA & SVA)	0.118	0.125	0.113	0.117

As indicated above the LAS LiDAR surface meets hard surface Fundamental Vertical Accuracy (FVA) project specifications of RMSEz less than or equal to 12.5 cm, with an RMSEz of 7.2 cm. The FVA 95% confidence level of 24.5 cm or less was also met with a value of 14.1 cm.

## DEM QC Accuracy Results

The table below presents the results of the QC accuracy analysis for the Howard Co., MO derived bare-earth ESRI Grid DEM tile data. All values are in meters.

Stat	Overall	Hard Surface (HS)	Grass (G)	Trees (TR)
Count	94	32	32	30
RMSEz (FVA)	0.070	0.073	0.065	0.073
95% Confidence Level (FVA)	0.138	0.142	0.128	0.144
95 <sup>th</sup> Percentile (CVA & SVA)	0.129	0.130	0.115	0.136

As indicated above the derived DEM LiDAR surface meets both Supplemental & Consolidated Vertical Accuracy (SVA & CVA) project specifications of 95<sup>th</sup> Percentile less than or equal to 36.3 cm.