MAPPING SURVEY QUALITY CONTROL REPORT

MOE 536-1.34

PID 123225

Submitted to: *District 10 Survey*

Date: April 2025

This report serves to summarize and certify the Mapping Survey furnished with this project meets the requirements of the ODOT Mapping Specifications, dated January 21st, 2022.

Prepared by

CADD and Mapping Services

OHIO DEPARTMENT OF TRANSPORTATION

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PROJECT SUMMARY

PURPOSE

The purpose of this document is to provide the recipient of the data necessary background information to make actionable decisions in use and applicability of the provided data. This includes overall Mapping Survey procedures and accuracy calculations made in adherence to the Ohio Department of Transportation Survey and Mapping Specifications.

PROJECT SUMMARY

Scope of Data Collection

Data provided for PID 123225 was compiled for engineering design use. The DTM utilizes a project specific aerial LiDAR dataset. Supplemental ground topo was not collected in the generation of the DTM. The 2D planimetrics were compiled using stereo compilation and flattened to two dimensions when delivered. Orthophotos were collected with a project specific data collection, which was also used in the stereo compilation, and orthorectified using a combination of project specific LiDAR and OSIP data for relief distortion removal.



Figure 1 Data inside boundary was collected at project level.

Datum and Coordinate System

All final deliverables provided are using the following Datums and Coordinate Systems.

Vertical

Orthometric Height Datum: *NAVD88*
Geoid Model: *GEOID18*

Horizontal

Coordinate System: Ohio State, Plane South Zone
Map Projection: *Lambert Conformal Conic*
Reference Frame: *NAD83 (2011)*
Ellipsoid: *GRS80*
Combined Scale Factor: *1.0000000*
Project Adjustment Factor: *1.0000000*

Units

All units for delivered files and data are using the US Survey Foot.

Data Collection Date(s)

Data was collected on 3/11/2025 and only represents the existing conditions of the project site at that time.

User can incorporate a map/list denoting multiple flight dates and the areas they captured.

PROJECT ACCURACY

DTM Accuracy Statement

This data set was tested to meet ASPRS Positional Accuracy Standards for Digital Geospatial Data (2014) for an Ohio Department of Transportation *0.07* (US ft.) $RMSE_Z$ Vertical Accuracy Class. Actual NVA accuracy was found to be $RMSE_Z$ = 0.03 US ft., equating to +/- 0.06 US ft. at 95% confidence level. Actual VVA accuracy was found to be $RMSE_Z$ = 0.23 US ft., equating to +/- 0.46 US ft. at 95% confidence level.

Horizontal Planimetric Accuracy Statement

This data set was tested to meet ASPRS Positional Accuracy Standards for Digital Geospatial Data (2014) for an Ohio Department of Transportation 0.21 (US ft.) $RMSE_X$ / $RMSE_Y$ Horizontal Accuracy Class. Actual positional accuracy was found to be $RMSE_X$ = 0.11 (US ft.) and $RMSE_Y$ = 0.01 (US ft.) which equates to Positional Horizontal Accuracy found to be $RMSE_R$ = 0.11 US ft., equating to +/- 0.20 US ft. at 95% confidence level.

Surveyor's Certification Statement

I, (*Timothy Burkholder*) do hereby certify that the Digital Terrain model and planimetrics generated by INS mapping has been checked and verified as to its horizontal and vertical accuracies as set forth in the Survey and Mapping Specifications. All observation data and RMSE calculations are included in my survey report and are made available to the Ohio Department of Transportation.

While the vegetated surface did not meet ODOT Location and Design Volume 4 requirements, due to site conditions and testing methodology it is the opinion of the Office of CADD and Mapping Services that these deliverables provide an accurate representation of the terrain at the time of collection.

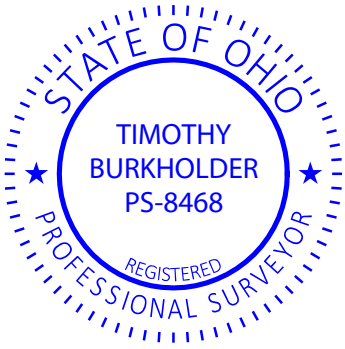
TBurkhol

Digitally signed by TBurkhol
DN: CN=TBurkhol, OU=People, OU=ODOT, OU=Central Office, OU=Divisions, DC=dot, DC=state, DC=oh, DC=us
Reason: I attest to the accuracy and integrity of this document
Date: 2025.04.30 15:17:40-04'00'

Signature

April 30, 2025

Date



PROJECT TEAM

This section outlines the parties responsible for completing these different aspects of the Mapping Survey.

Project Control Completed by:
CADD and Mapping Services Survey (Aerial Control only)

Report Submitted by:
CADD and Mapping Services Tim Burkholder

Mapping Performed by:
CADD and Mapping Services Staff

Mapping Checked by:
CADD and Mapping Services Tim Burkholder

Conventional Mapping Survey Performed by:
N/A

Mapping Deliverables Aggregated by:
N/A

PROJECT NOTES

This section describes any additional project related information relevant to the future use of the data.

DTM Notes

- All subsurface drainage, ditch inverts, or channel inverts require field collection and inclusion into the furnished existing surface model.
- Areas with dense brush or heavy vegetation require field collection and inclusion into the existing surface model.
- Retaining walls and bridges require field collection and inclusion into the existing surface model. (Some break lines were added from aerial planimetrics)
- Voids were created for areas of low confidence.

Horizontal Planimetric Notes

- Only features visible from the air were collected.
    - All subsurface utilities require field collection.

Orthophoto Notes

- OSIP data was used to supplement outside of project limits in processing
- .TFW files are required to utilize georeferenced imagery in native project coordinate system

Mapping Control/ Check Point Notes

- All mapping control was collected using primary project control.

Miscellaneous Notes

- LiDAR and Photo collected simultaneously.
- A Null Terrain was generated for the final complex terrain model. The intent is to generate a complex terrain from a single terrain to facilitate expansion and additional features to be added after the fact. This will all designers to utilize the complex (which will have the same unique ID) and allow for other terrains and edits to be added without the need to target a new terrain once work begins if it is required. Bentley resource (SIG Workshop: OpenRoads - Modeling Terrain in OpenRoads Designer (on24.com)).

Vertical Accuracy Statistic Worksheet

VERTICAL ACCURACY STATISTIC WORKSHEET (NVA AND VVA)

Vertical Accuracy was calculated using field collected data and compared to project specific LiDAR. The following data was collected and verified using the Ohio South Zone based survey control and the coordinates reflect that system in the Worksheets here (123225_Vertical_Accuracy_Worksheet.xlsx).

Horizontal Accuracy Statistic Worksheet

HORIZONTAL ACCURACY STATISTIC WORKSHEET

Horizontal Accuracy was calculated using field collected data and extracted linework using stereo photography. The following data was collected and verified using the Ohio South based survey control and the coordinates reflect that system in the Worksheet here (123225_HorizontalAccuracyWorksheet.xlsx).