

# Technical Requirements for Advanced Users and Vendors

## Format:

Imagery must be digital and orthorectified. Projects that seek to create imagery that is not truly orthorectified will not be accepted. Minimum data requirements for orthorectification include lens and sensor information, horizontal ground control, vertical control, usually in the form of a digital elevation model or contour data, and raw aerial imagery acquired with at least 60% endlap and 30% sidelap. Imagery that is collected without necessary overlap does not result in true orthorectified imagery.

## Resolution:

Raw aerial imagery must have a minimum ground sample distance (GSD) of 2.0 x 2.0 feet and the resulting pixel resolution of the digital product must be at least 2.0 feet x 2.0 feet actual. Resampling from, or unsuitable scanning of, small-scale imagery to create smaller, non-representative pixel sizes is not acceptable. For instance, flying higher reduces cost of acquisition but results in small-scale imagery. Small-scale imagery that is scanned at a very high resolution will not necessarily result in functional high-resolution imagery due to the granularity of film for photographic sensors or the size of the charge-coupled devices (CCDs) in digital sensor.

If the original acquired imagery is less than 2.0 x 2.0 feet GSD, for example, 0.5 x 0.5 feet GSD, the SOM reserves the right to resample the imagery to a 2.0 x 2.0 feet GSD for general distribution via our website.

If the original acquired imagery is equal to 2.0 x 2.0 feet GSD, the SOM would like to negotiate the general distribution rights and responsibilities.

## Spatial Data Accuracy

All orthoimagery projects must meet Class I ASPRS Accuracy Standards for large-scale maps 1:4,800 or larger (Table 1). Root Mean Squared Error (RMSE) values for ASPRS standards represent a 68% confidence interval (1 standard deviation).

ASPRS Planimetric Feature Coordinate Accuracy Requirement (Ground X or Y) for Well-Defined Points										
Target Scale	Map	ASPRS Limiting RMSE in X or Y (Meters)			Target Scale	Map	ASPRS Limiting RMSE in X or Y (Feet)			
Ratio m/m		Class 1	Class 2	Class 3	1"=x ft		Ratio, ft/ft	Class 1	Class 2	Class 3
1:500		0.125	0.25	0.375	40		1:480	0.4	0.8	1.2
1:1,000		0.25	0.50	0.75	50		1:600	0.5	1.0	1.5
1:2,000		0.50	1.00	1.5	60		1:720	0.6	1.2	1.8
1:2,500		0.63	1.25	1.9	100		1:1,200	1.0	2.0	3.0
1:3,000		0.75	1.5	2.25	200		1:2,400	2.0	4.0	6.0
1:4,000		1.0	2.0	3.0	300		1:3,600	3.0	6.0	9.0
1:5,000		1.25	2.5	3.75	400		1:4,800	4.0	8.0	12.0
1:8,000		2.0	4.0	6.0	500		1:6,000	5.0	10.0	15.0
1:9,000		2.25	4.5	6.75	600		1:7,200	6.0	12.0	18.0
1:10,000		2.5	5.0	7.5	800		1:9,600	8.0	16.0	24.0
1:16,000		4.0	8.0	12.0	1,000		1:12,000	10.0	20.0	30.0
1:20,000		5.0	10.0	15.0	1,667		1:20,000	16.7	33.0	50.0

Furthermore, contracts between counties and vendors must include a testing and reporting component that is consistent with Section 3.2 of Chapter 3 of the FGDC Geospatial Positioning Accuracy document, which can be found at:

<http://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part3/chapter3>

This document outlines the necessary methods and requirements for testing and reporting using the National Standard for Spatial Data Accuracy (NSSDA).

### **Quality Control – Metadata**

For all contracts entered into between the State of Michigan and the local body prior to the acquisition of the imagery, the State will require metadata be made available by the vendor. Where the State enters into a contract with the Local body after the imagery has been acquired, the State will negotiate one on one with the local body to make arrangements on how the metadata can be secured from the vendor. The State of Michigan is asking the metadata at least meet the *FGDC standard* (the [Content Standard for Digital Geospatial Metadata](#)). More information is available at the FGDC web site <http://www.fgdc.gov/metadata>.

To be included with the metadata is the Aerial Photography Report and the Analytic Triangulation Report.

(elevation models)