

**Acceptance Criteria for
Los Angeles Region Image Acquisition Consortium
Prepared: December 2005**

	Tested Characteristic	Measure of Acceptability
A	All Scales Natural Color and Near Infrared Digital Orthoimagery (100-Scale, 200-Scale)	
A.1.	Media: DVD 2.0, 4.7 GB single sided (4.3 GB usable), snap server with 2 TB	Media is readable, all files accessible, no files corrupted
A.2.	Media label	As specified by L.A. County
A.3.	File organization	Files written in tile sheet order
A.4.	File name	Conforms to required convention- based on CA SPCS Zone 5 xxxx_yyyya for 4 inch and xxxx_yyyy for 1 foot orthos
A.5.	GeoTIFF format	File reads in ESRI (see sample of Geotiff header)
A.6.	Files must open in correct location	Files must open with ESRI software
A.7.	Pixel definition	File must reference to the center of the pixel located in the upper left hand corner of the tile as the point of origin.
A.8.	Georeferencing	for correct pixel size 0.33 ft (4 inch) and 1 ft.
A.9.	Vertical Datum	NAVD88
A.10.	Projection	NAD 1983 State Plane – California Zone V
A.11.	Datum	NAD 83 reference datum
A.12.	Units	U.S. Survey Feet
A.13.	24 bit natural color	256 levels of value for each band, 0=black, 255=white
A.14.	Tonal quality	< 2 percent of values at 0 or 255, to the extent possible per client's radiometry choices
A.15.	DMC sensor anomalies	TBD
A.16.	Conformance of tile index grid	tile matches grid, no gaps between tiles at 1:1 view.
A.17.	Image Appearance	The difference in average pixel values on either side of a mosaic seam-line should generally not exceed 70 (30 preferred), when measured on a homogeneous surface with similar characteristics (water surfaces are exempt from this requirement). Greater differences may be allowed if the correction will cause significant degradation of the image content on either side. No image will be rejected for such radiometry

		inconsistencies without prior approval of L.A. County. Image acquisition should be obtained with acceptable weather conditions per ASPRS standards.
A.18.	Radiometry	Radiometry should be consistent throughout the imagery, on large and small scales. Mosaic seamlines should not produce great visual (tonal, brightness) differences in imagery on either side (water being exempt from this requirement). In some instances, greater differences may be allowed if the correction will cause significant degradation of the image content on either side. Color balancing between tiles should be as consistent as possible. Radiometry target chips will be reviewed and approved by the LAR-IAC prior to orthoimagery production. The chips will provide a guide and expectation of final imagery appearance.
A.19.	Smears	Normally corrected by adding mass points or breaklines to DEM/DSM as necessary to reflect actual terrain or by image processing where appropriate. Where DSM/DEM corrections or image processing will result in reduced horizontal accuracy or misrepresentation of the location or appearance of important features (buildings, roads, etc.), the smear will remain untreated. No image will be rejected for smears without prior approval of L.A. County.
A.20.	Wavy features	Distinct linear ground features (such as road markings, and curbs) should not deviate from their apparent path by more than 3 feet measured perpendicular to the feature within any 100 foot distance measured along the feature length.
A.21.	Mosaic lines	No mosaic lines through buildings. No mosaic lines through above ground transportation structures carrying automobiles or trains unless unavoidable.
A.22.	Metadata	Complies with standard (to be determined by L.A. County). Meets minimum FGDC Content Standard.
A.23.	Building lean within Downtown areas (polygons provided by LA County)	The maximum displacement of a 10 story building at the edge of a model will be 16 feet (approximately 1.6 feet per story)
A.24.	Bridges	Accuracy of multi-layered bridge decks

		identified by L.A. County TBD.
A.25.	Coverage	At least 500' beyond LAR-IAC boundary
A.26.	Tile grid layout	At least 500' buffer around LAR-IAC boundary

B	1-foot GSD, equivalent to 1"=200'-scale (1:2400)	
B.1.	Ground Resolution	1 foot
B.2.	Tile size	5280' x 5280'
B.3.	RMSE of QA/QC points measured on the image <i>See ASPRS Class I Standards Page 8, Table 16, and NSSDA Part 3, Appendices 3-A and 3-D for explanation of formulas.</i>	RMSE _x = RMSE _y = 2' (2 pixels) or RMSE _r = 1.4142*RMSE _x = 2.83'
B.4.	NSSDA radial accuracy	NSSDA accuracy (95% confidence level) such that 1.7308 * RMSE _r < 5ft
B.5.	Mismatch of features along mosaic lines and production block boundaries of equal scale	Equal to or less than 3 pixels on well defined ground features (roads, sidewalks, curbs).
C	4 inch GSD, equivalent to 1"=100'-scale (1:1200)	
C.1.	Ground Resolution	0.33 U.S. survey foot (2 decimals)
C.2.	Tile size	2640' x 2640' (8000 pixels x 8000 pixels)
C.3.	RMSE of known ground points measured on the image <i>See ASPRS Class I Standards Page 8, Table 16, and NSSDA Part 3, Appendices 3-A and 3-D for explanation of formulas.</i>	RMSE _x = RMSE _y = 1.0-ft RMSE _r = 1.4142*RMSE _x = 1.4142*RMSE _y = 1.41-ft
C.4.	NSSDA radial accuracy	NSSDA accuracy (20+ points) such that 1.73 * RMSE _r < 2.5'
C.5.	Mismatch of features along mosaic lines between pixel resolution blocks of equal scale	Equal to or less than 4 pixels on well defined ground features (roads, sidewalks, curbs).
C.6.	Mismatch of features between 1-foot and 4-inch images	Equal to or less than 3 pixels (1 ft) on well defined ground features (roads, sidewalks, curbs).

Aerotriangulation Acceptance Criteria

D	Tested Characteristic	Measure of Acceptability
D.1.	Report Format	Conforms to required convention
D.2.	Report Completeness	All information complete and readable
D.3.	PATB readable	Conforms to PATB output file for model

		setting.
D.4.	1"=100' map scale AT Horizontal accuracy against ground control	For 100' AT blocks, RMSE _x and RMSE _y values are acceptable up to 0.35'. RMSE _r is acceptable up to 0.5'. Higher RMSE values are subject to review.
D.5.	1"=200' map scale AT Horizontal accuracy against ground control	For 200' AT blocks, RMSE _x and RMSE _y values are acceptable up to 0.6'. RMSE _r is acceptable up to 0.84'. Higher RMSE values are subject to review.
D.6.	RMSE of control and tie points.	<10 micron. Higher RMSE values are subject to review.
D.7.	RMSE of survey check points	Not to exceed 12 micron
D.8.	NSSDA analysis [E, N] of 20+ QA points	95% within 1.73 * RMSE for corresponding scale

Ground Control Acceptance Criteria

E	Tested Characteristic	Measure of Acceptability
E.1.	Report Format	Conforms to required convention
E.2.	Report Completeness	All information complete and readable
E.3.	Approval	CA Licensed Surveyor Signature and Seal
E.4.	Monument Record Form	Sufficient information to revisit point, description and picture
E.5.	Network	Meet NOAA specifications for Order and Class
E.6.	Geodetic Survey: Horizontal Accuracy	Second Order Class 1 tied to NGS monuments.
E.7.	Geodetic Survey: Vertical Accuracy	Third Order.
E.8.	Coordinate System	California Coordinate System of 1983, Zone 5,
E.9.	Epoch	Epoch date: 2004.0

Digital Surface Model QA Acceptance Criteria (suitable only for orthorectification)

F	Tested Characteristic All Scales	Measure of Acceptability
F.1.	Media: DVD 2.0, 4.7 GB single sided (4.3 GB usable), snap server with 2 TB	Media is readable, all files accessible, no files corrupted
F.2.	File organization	Files written one per ortho tile delivered. Size TBD
F.3.	File name	Conforms to required convention
F.4.	Format	ArcGIS raster
F.5.	Format	Microstation .dgn Version V8.
F.6.	Georeferencing	Locates in proper tile grid cell
F.7.	Mass point locations	Mass points sufficient to accurately build

		terrain to support orthophotos;
F.8.	Breakline locations	Breaklines as needed to control bridges, edge of pavement, hydrographic features, ridgelines, retaining walls as needed for orthorectification, none in open water.
F.9.	Continuity	No spikes, holes or blunders; no gaps of sufficient size to affect orthorectification, regardless of perspective center.
F.10.	Breakline Format	Microstation .dgn V8

Horizontal QA/QC Point Acceptance Criteria

G	Tested Characteristic All Scales	Measure of Acceptability
G.1.	Visibility on digital imagery	QA/QC checkpoints must be clearly photo-identifiable on images at map scales evaluated (4-inch and 1-foot orthos)
G.2.	Well defined	Points must be clearly visible and not elevated (no fence posts, fire hydrants, etc.) that cast shadows
G.3.	Documentation	Each point is documented to describe the photo-identifiable feature surveyed
G.4.	Terrestrial images	Each point is photographed from the ground to help in photo-identification
G.5.	Survey accuracy and description of survey procedure used	Accuracy estimate, to include description of survey procedures used to achieve such accuracy

Stereo Model Acceptance Criteria (Deleted)

K	Tested Characteristic All Scales	Measure of Acceptability
K.1.	Media: DVD 2.0, 4.7 GB single sided (4.3 GB usable), snap server with 2 TB	Media is readable, all files accessible, no files corrupted
K.2.	File organization	Files written based on flight exposure index
K.3.	File name	Conforms to required convention
K.4.	Format	Tiff jpeg (q:10)
K.5.	Orientation Parameter Format	PAT-B compatible for exposure center and exterior orientation angles
K.6.	Georeferencing	Displays in correct location
K.7.	Stereo Viewing	Displays without parallax
K.8.	System compatibility	Works with Intergraph Image Station software suite

Sample GeoTIFF header

```
w_13920940_12_07200_col_2005.txt
Geotiff_Information:
  Version: 1
  Key_Revision: 1.0
  Tagged_Information:
    ModelTiepointTag (2,3):
      0          0          0
      1392000    942000    0
    ModelPixelScaleTag (1,3):
      1          1          0
  End_Of_Tags.
  Keyed_Information:
    GTModelTypeGeoKey (Short,1): ModelTypeProjected
    GTRasterTypeGeoKey (Short,1): RasterPixelIsArea
    GeogGeodeticDatumGeoKey (Short,1): Datum_North_American_Datum_1983
    GeogEllipsoidGeoKey (Short,1): Ellipse_GRS_1980
    ProjectedCSTypeGeoKey (Short,1): PCS_NAD83_New_York_West
    PCSCitationGeoKey (Ascii,83): "State Plane Coordinate System 1983; North
American 1983; GRS80; Zone New York West"
    ProjLinearUnitsGeoKey (Short,1): Linear_Foot_US_Survey
    ProjNatOriginLongGeoKey (Double,1): -78.5833333
    ProjNatOriginLatGeoKey (Double,1): 40
    ProjFalseEastingGeoKey (Double,1): 1148291.67
    ProjFalseNorthingGeoKey (Double,1): 0
    ProjScaleAtNatOriginGeoKey (Double,1): 0.9999375
  End_Of_Keys.
  End_Of_Geotiff.

PCS = 32117 (name unknown)
Projection = 13133 ()
GCS: 4269/NAD83
Datum: 6269/North American Datum 1983
Ellipsoid: 7019/GRS 1980 (6378137.00,6356752.31)
Prime Meridian: 8901/Greenwich (0.000000/ 0d 0' 0.00"E)
Projection Linear Units: 9003/(unknown) (1.000000m)

Corner Coordinates:
Upper Left (1392000.000, 942000.000)
Lower Left (1392000.000, 940000.000)
Upper Right (1395000.000, 942000.000)
Lower Right (1395000.000, 940000.000)
Center (1393500.000, 941000.000)
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