

**DIGITAL ORTHOPHOTOS**

**01. General:**

A digital orthophoto is a digital image that has the properties of an orthographic projection. It is digitized from a perspective aerial photograph by differential rectification so that image displacements caused by camera tilt and relief terrain are removed. The digital orthophoto is created by scanning an aerial photograph diapositive transparency or an aerial photograph negative with a precision image scanner. The scanned data file is then digitally rectified to an orthographic projection by processing each image pixel through photogrammetric space resection equations. This process requires, as input, ground control points acquired from ground surveys and airborne GPS and developed in aerotriangulation, camera orientation parameters, and a digital terrain/elevation model. A digital image, developed by scanning a traditional hardcopy orthophoto, is not considered a digital orthophoto under these specifications and is not acceptable as a digital orthophoto.

**02. Orthophoto Accuracy Standards:**

Orthophotos shall meet the ASPRS Class II horizontal accuracy standards as follows:

<u>Orthophoto Scale</u>	<u>ASPRS Limiting RMSE in X or Y (Class II)</u>
1" = 400'	8.0'
1" = 200'	4.0'
1" = 100'	2.0'
1" = 50'	1.0'

All orthophotos may be subject to quality control testing by the Contracting Officer, by independent third parties, and/or by the Contractor working under direct Contracting Officer review to ensure that orthophotos comply with the accuracy requirements listed above.

**03. Aerial Photography:**

The aerial photography used to develop digital orthophotos shall be vertical photography flown during the period when deciduous trees are barren and when the sun angle or elevation is not less than 33 degrees above the horizon. The photography shall have an endlap of sixty percent (60%); sidelap between adjacent parallel flight lines shall average thirty percent (30%); crab shall not be in excess of three (3) degrees; and, tilt of the camera from verticality at the instant of exposure shall not exceed three (3) degrees.

**04. Scale of Aerial Photography Negatives:**

The altitude above average ground elevation for aerial photography shall be such that the negatives will be at the scale specified in the following schedule:

<u>Description</u>	<u>Orthophoto Scale</u>	<u>Negative Scale</u>
Rural	1" = 400'	1" = 2,400'
Semi-Rural	1" = 200'	1" = 1,200'
Urban	1" = 100'	1" = 600'
Urban	1" = 50'	1" = 300'

Negatives deviating from the above scales by more than five percent (5%) may be rejected

**05. Negatives/Diapositives For Scanning:**

The original aerial photography negatives and/or one set of diapositives made from the original aerial photography negatives (not from duplicate negatives) shall be used for the scanning operation.

- a. Original aerial photography negatives. The negatives are to be handled with the utmost care to ensure maximum image quality. The scanned images will preserve the clarity and detail of the original negatives to the maximum extent possible. The scanning process will be done in such a manner (dodging) as to eliminate the incidence of "hot spots" in the resulting scanned images. Care will be taken to prevent lint from collecting on the original negatives. Fiducial marks shall be included in the resulting scanned images.
- b. Diapositives. The diapositives are only to be used for scanning and are to be handled with the utmost care to ensure maximum image quality. The diapositives shall not contain defects such as out of focus imagery, dust marks, scratches, extraneous marks or annotation, discontinuities in tone, or other inconsistencies except those resulting from corresponding defects in the original aerial negatives which cannot be remedied during image processing. The diapositives and the resulting scanned images will preserve the clarity and detail of the original negatives to the maximum extent possible. Care will be taken to prevent lint from collecting on the original negatives and diapositives. Fiducial marks shall be included in the diapositives and the resulting scanned images.

**06. Scanning Device:**

The device used for scanning shall be a precision instrument designed and manufactured for use on aerial film and/or diapositives with an aperture which can produce a scanning resolution of at least 9.5 microns (approximately 2600 dots per inch), geometric accuracy of less than 5 microns RMSE, and a capability of resolving 256 levels of gray and 256 hue levels each of red, green, and blue bands. Scanner specifications, a camera(s) calibration report, diagnostic reports, and/or other test results showing accuracy, resolution, and ability to distinguish tonal qualities shall be submitted to the Contracting Officer for approval before proceeding with the scanning phase.

**07. Scanning Resolution:**

Negatives and/or diapositives will be scanned so that the resultant pixel resolution for 1" = 600' aerial photography shall be .25 foot, 1" = 1200' aerial photography shall be .50 foot, and 1" = 2400' aerial photography shall be 1 foot. Pixel resolution shall not be interpolated to a finer resolution than that developed through the initial scanning; interpolation of pixel resolution to a coarser resolution is allowed.

**08. DTM/DEM:**

- a. A Digital Terrain Model (DTM)/Digital Elevation Model (DEM) shall be developed at a density level necessary to support the orthophoto production. Terrain/elevation data used in the development of the DTM/DEM shall be captured by photogrammetric techniques using a 1st order analytical stereoplottor or a softcopy workstation or derived from recent LIDAR data. The DTM/DEM will consist of points spaced at regular intervals along a grid, points of significant high or low elevations, and ortho specific breaklines at all significant terrain breaks. It is not necessary to capture breaklines at all curbs, ditches, stream banks, or other similar minor terrain breaks. Elevation/terrain data shall be captured at a density level sufficient to accurately represent the shape of the ground and to meet the required orthophoto accuracy standards of ASPRS Class II. A DTM/DEM developed either wholly or in part from autocorrelation shall not be utilized in the production of the digital orthophotos.
- b. The DTM/DEM data is not to be stored as a record (Z component) for each pixel of the orthophoto image.
- c. The Contractor shall provide to the County the DTM/DEM in a format that can be used on the Counties' GIS system or in an acceptable standard data exchange

format. Note: The DTM/DEM data will be used for the draping of images and data sets, and it is acknowledged that the DTM/DEM is not suitable for detailed engineering activities.

- d. DTM/DEM data from a prior orthophoto project shall not be used for a new project. If approved by the Contracting Officer, DTM/DEM data from a prior ortho project may be used for a new project after extensive updating by the Contractor.

**09. Image Radiometry:**

There shall be no areas of an orthophoto where ortho production process was incomplete due to incomplete data (i.e., lack of DTM/DEM data, image gaps, etc.). The finished digital orthophoto shall have an image quality the same as or better than the original unrectified input image.

**10. Ground Resolution:**

The horizontal ground resolution (x and y components) of the finished digital orthophoto image (both hardcopy and softcopy) shall be at a minimum of 1 foot for 1" = 400' orthophotos, .50 foot for 1" = 200' orthophotos, and .25 foot for 1" = 100' orthophotos.

**11. Image Rectification Algorithm:**

Image rectification shall be carried out using either cubic convolution or better algorithm.

**12. Softcopy Coverage Area:**

The geographic extent of each softcopy digital orthophoto shall be based on the North Carolina Land Records Management Program's "Basic Modular Unit" and shall cover the same geographic area. The softcopy digital orthophoto shall only contain the neat image of the corresponding map unit, and there shall be no image overlap between adjacent softcopy digital orthophotos.

**13. Image Mosaicking:**

Mosaicking shall be accomplished using both automated and interactive (manual) methods; the sole use of fully automated methods is not acceptable. Mosaic join lines shall not cross through building, bridges, or other structures or items which could be considered as a visual entity and shall try to follow features such as roads, tree lines,

water bodies, etc when possible. Acceptable mosaicking must produce quality orthophoto imagery of consistent tone and contrast and must do so without obvious join lines.

- a. Interior mosaicking. Interior mosaicking occurs when an orthophoto cannot or is not made from a single scanned aerial photograph, and the orthophoto is made from two or more scanned aerial photographs. The join line between photograph images shall be chosen so as to minimize the obtrusiveness of the join itself and to reduce the difference in tone and contrast between the different photograph images. Interior mosaicking shall not affect the positional accuracy of the orthophoto. The Contractor shall provide the Contracting Officer with sample softcopy images to evaluate. The Contracting Officer will select one mosaicked image that will become the reference to which all subsequent softcopy orthophotos will be compared for interior mosaicking acceptance/rejection.
- b. Edge mosaicking and feathering. Mosaicking and feathering at/near the edge lines of adjacent orthophotos is permitted in order to create a nearly seamless image of the entire project area and to minimize any visual edge lines of adjacent orthophotos due to tonal variations. The mosaicked edge line between adjacent orthophotos shall be chosen so as to minimize the obtrusiveness of the edge line itself. If feathering (a process used on the join between two adjacent orthophotos to help reduce the difference in tone and contrast between the adjacent orthophotos) is used along the edge line, it shall not result in any noticeable image degradation such as image blurring or double imagery. Edge mosaicking and feathering shall not affect the positional accuracy of the orthophoto. The Contractor shall provide the Contracting Officer with samples of edge mosaicking and feathering to evaluate. The Contracting Officer will select one image set (four adjacent orthophotos) which will become the reference to which all sequent softcopy orthophotos will be compared for edge mosaicking and feathering acceptance/rejection.

**14. Border Data:**

Traditional hardcopy map border data such as map number, north arrow, grid ticks, grid coordinate values, etc shall not be a part of the softcopy digital orthophoto image.

**15. Sample/Pilot Products:**

Prior to initiating check plots and final softcopy production, the Contractor shall provide the Contracting Officer with sample softcopy image sets to evaluate and

accept as examples of overall image quality. The Contracting Officer will select one or more image sets that will become the reference to which all subsequent softcopy orthophotos will be compared for image quality acceptance/rejection. The sets will consist of four or more adjacent, like scale orthophotos and also three or more adjacent, unlike scale (e.g. 100' and 200') orthophotos.

**16. Orthophoto Image Quality:**

- a. The softcopy orthophoto image shall be compared to the original aerial negative image to determine if the orthophoto image has the same, or better image quality as the original aerial negative. The softcopy orthophoto shall not contain defects such as out of focus imagery, dust marks, scratches, discontinuities in tone, or other inconsistencies except those resulting from corresponding defects in the original aerial negatives which cannot be remedied during image processing.
- b. All softcopy digital orthophotos shall be radiometrically adjusted as necessary so that adjacent digital orthophotos can be displayed simultaneously without an obvious visual edge seam between them.

**17. File Compression:**

The Contractor shall deliver to the County a complete set of uncompressed digital orthophoto images in a format (e.g. TIFF, BIL) and media (e.g. CD-Rom, tape, DVD) selected by the Contracting Officer. In addition to the uncompressed images, the Contractor shall also deliver to the county two sets of compressed orthophoto images using an industry accepted compression tool agreed upon by the Contracting Officer. The Contractor shall prepare a set of sample compressed images of two adjacent orthophotos with compression ratios of 1:10, 1:20, 1:30, 1:40, and 1:50 on the media. The Contractor shall create two sets of the compressed orthophotos using the Contracting Officer's chosen compression ratios for delivery to the county on the media.

**18. Softcopy Mask:**

A softcopy mask shall be prepared for each digital orthophoto. The softcopy mask will consist of the items required on a North Carolina Land Records Management Program hardcopy orthophoto and these items will be in the same proportions and locations as found on the hardcopy orthophoto. When a digital orthophoto image and its corresponding softcopy mask are plotted together at regular hardcopy scale, the result

will be a product that is similar in size, shape, content, and item location to a North Carolina Land records Management Program hardcopy orthophoto.

**19. Deliverable Product Format:**

- a. The Contractor will only provide digital data to the County in a format that can be used on the County's GIS system or in an acceptable standard data exchange format. If the Contractor's GIS system either uses or can produce digital files in the same format that is used by the County, the information shall be transferred in that format. If there is a specific intermediate format that will facilitate the transfer of the data between the two computer mapping systems, then the intermediate format may be used with the written approval of the Contracting Officer. Care will be taken by the Contractor in the construction of the data files to assure that data is compatible with and will work on the County's GIS system. Data will not be considered as delivered until the data has been successfully loaded and utilized on the County's system. (This assumes that the County has an operating GIS system at the time of delivery and that problems are wholly data related and not hardware or software related)
- b. The Contractor shall transfer the digital data to the County on a media agreed upon between the Contracting Officer and the Contractor. Each media item will be accompanied by a report or label that specifies the name of each file, the size of each file, the map number of each map on the media, and the name of the Contractor.

**20. Deliverable Items by Contractor:**

At the completion of the mapping project or at a time which facilitates the flow of work, the Contractor shall deliver to the Contracting Officer for his/her acceptance the following items:

- a. One copy of each digital orthophoto image and its associated georeferencing/header file on the selected media. The georeferencing/header file shall contain the following items and shall be in the format as shown in attachment 1:
  - (1) Georeferencing information
  - (2) Map name or number
  - (3) Nominal map scale
  - (4) Location of Map - (county)
  - (5) Name of Contractor

- (6) Name and license number of land surveyor/photogrammetrist in charge of project
  - (7) Coordinate system of map - (NC State Plane)
  - (8) Horizontal datum
  - (9) Map unit - (feet)
  - (10) Feet / meter conversion – (US Survey Foot)
  - (11) Image pixel resolution
  - (12) Lower left map coordinate
  - (13) Upper left map coordinate
  - (14) Upper right map coordinate
  - (15) Lower right map coordinate
  - (16) Aerial camera type
  - (17) Lens serial number
  - (18) Lens resolving power (AWAR)
  - (19) Lens focal length
  - (20) System resolving power (AWAR)
  - (21) Photography film type
  - (22) Negative scale of photography
  - (23) Photography date
  - (24) Map horizontal accuracy
  - (25) DEM development
  - (26) Mapping standards used – (NC Land Records Management Mapping Specifications, 2004)
- b. One copy of each softcopy mask on the selected media.
  - c. One Mylar copy of each digital orthophoto with its corresponding softcopy of mask if specified by the Contracting Officer at the beginning of the project.
  - d. One copy of the DTM/DEM used in the development of the digital orthophotos in uncompressed ASCII format on the selected media.
  - e. Metadata project report.
  - f. Map index in hardcopy (paper) and digital form showing the layout/location of the orthophotos.
  - g. Two compressed files at the specified compression ratios for each orthophoto on the specified media.
  - h. Project Report as described in Section 23.
  - i. The original aerial film.
  - j. The diapositives as described in Section 05, if made.

**21. Hardcopy Orthophotos:**

If specified by the Contracting Officer at the beginning of the project, one positive reproducible of each digital orthophoto shall be provided on polyester material with a minimum thickness of .003 inch. The hardcopy orthophotos shall be prepared from the digital orthophoto files and the corresponding softcopy masks. The hardcopy orthophotos are to be high quality products using a “filmwriter” or a comparable photographic imaging process; hardcopy orthophotos produced from a plotter are not acceptable.

**22. Media/Packaging:**

The Contractor will deliver the digital orthophoto image files on the exchange media as agreed upon between the Contracting Officer and the Contractor.

**23. Project Report:**

At the completion of the project, the Contractor shall deliver to the Contracting Officer two copies of a project report. One copy of the project report shall be hardcopy (paper); the second copy of the project report shall be softcopy (as a PDF file) and shall accompany and be a part of the digital orthophoto delivery. The project report shall contain the following information:

- (1) Date of photography by scale.
- (2) Altitude of camera and camera focal length.
- (3) Date of data set compilation by scale.
- (4) Coordinate system for horizontal and vertical control denoting metric or English units (i.e., NAD83, assumed, or other coordinate system).
- (5) A list of the ground control points used for the project. The minimum data shown for each point shall include: physical attributes (i.e. iron rod, railroad spike, etc), X and Y Grid coordinates, and elevation, as applicable.
- (6) A statement of accuracy of the orthophotos.
- (7) A county map of suitable scale and detail depicting the individual orthophotos prepared by scale and map number and a count of the total number of orthophotos prepared by scale.
- (8) Company name, address and phone number.
- (9) The name of the County agency for whom the project was conducted.

- (10) A statement that the orthophotos meet the Land Record Management Program Mapping Specifications and, if applicable, a listing of exceptions to the Mapping Specifications.
- (11) A certificate, substantially in the following form or a form required by the North Carolina Board of Engineers and Land Surveyors, signed, sealed, and dated by the surveyor in control of the project:

“ I, \_\_\_\_\_, certify that this project was completed under my direct and responsible charge from an actual photogrammetric survey made under my supervision: that this survey was performed to meet Land Records Management Program Standards as applicable; that the imagery and/or original data was obtained on \_\_\_\_\_; that the survey was completed on \_\_\_\_\_.”

A project is not considered completed until a Project Report has been submitted to and accepted by the Contracting Officer.

## Attachment 1

### ORTHOPHOTO GEOREFERENCING/INFORMATION HEADER FILE

1.000000000000000  
0.000000000000000  
0.000000000000000  
-1.000000000000000  
2000000.500000  
439999.500000  
MAP NAME/#=040301  
NOMINAL MAP SCALE=1 INCH EQUALS 200 FEET  
LOCATION=CUMBERLAND COUNTY, NORTH CAROLINA  
IMAGE PRODUCED BY =ORTHO MAPPING CO. RALEIGH, NC  
LAND SURVEYOR/PHOTOGRAMMETRIST IN CHARGE=JOE CAROLINA, NC PLS #123456  
COORDINATE SYSTEM=NC STATE PLANE  
HORIZONTAL DATUM=NAD 1983  
MAP UNIT=FEET  
FEET/METER CONVERSION=US SURVEY FOOT (1 METER = 3.2808333333 FT)  
IMAGE PIXEL RESOLUTION=0.50 FOOT  
LOWER LEFT MAP COORDINATE=E2000000 N435000  
UPPER LEFT MAP COORDINATE=E2000000 N440000  
UPPER RIGHT MAP COORDINATE=E2005000 N440000  
LOWER RIGHT MAP COORDINATE=E2005000 N435000  
AERIAL CAMERA TYPE=WILD RC-30  
LENSE SERIAL NUMBER=13328  
LENS RESOLVING POWER (AWAR)=113 CYCLES/MM AREA-WEIGHTED AVERAGE RESOLUTION  
LENS FOCAL LENGTH=153.462 MM  
SYSTEM RESOLVING POWER (AWAR)=55 CYCLES/MM AREA WEIGHTED AVERAGE RESOLUTION  
PHOTOGRAPHY FILM TYPE=KODAK 2405, BLACK & WHITE  
NEGATIVE SCALE OF PHOTOGRAPHY=1:14000 (1"=1200')  
PHOTOGRAPHY DATE=03/08/2000  
MAP HORIZONTAL ACCURACY= LIMITING RMSE IS 4 FEET IN X OR Y; MEETS OR EXCEEDS ASPRS CLASS II  
ACCURACY STANDARDS  
DEM=THE DIGITAL ELEVATION MODEL FOR THIS ORTHOPHOTO WAS DEVELOPED FROM LIDAR DATA FROM  
THE NC FLOODPLAIN MAPPING PROJECT. BREAKLINE DATA WAS COMPILED USING ANALYTICAL  
DIGITAL PHOTOGRAMMETRIC TECHNIQUES AND IS INTENDED TO SUPPORT ORTHOPHOTO  
PRODUCTION ONLY – IT IS NOT SUITABLE FOR THE CREATION OF ACCURATE CONTOUR MAPPING.  
MAPPING STANDARDS=MAP COMPILED AND PRODUCED TO NC LAND RECORDS MANAGEMENT PROGRAM  
MAPPING SPECIFICATIONS, 2004

## Digital Black and White Orthophotography for County A, North Carolina, March 2001 (1-foot pixels)

Metadata also available as:

Metadata:

- [Identification Information](#)
- [Data Quality Information](#)
- [Spatial Data Organization Information](#)
- [Spatial Reference Information](#)
- [Entity and Attribute Information](#)
- [Distribution Information](#)
- [Metadata Reference Information](#)

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### *Identification Information:*

*Citation:*

*Citation Information:*

*Originator:* County A GIS Department

*Publication Date:* 20040301

*Title:*

Digital Black and White Orthophotography for County A, North Carolina, March 2001 (1-foot pixels)

*Online Linkage:* <<http://www.countya.nc.org/gis.html>>

*Online Linkage:* getmap request

*Description:*

*Abstract:*

An orthoimage is remotely sensed image data in which displacement of features in the image caused by terrain relief and sensor orientation have been mathematically removed. Orthoimagery combines the image characteristics of a photograph with the geometric qualities of a map. For this dataset, the orthoimages were produced at a 1-foot pixel resolution for County A, North Carolina, flown in March 2001. Mapping scale is 1"=200' (1:2400). Negative scale of the photography is 1"=1200'.

*Purpose:*

This data was developed to provide a spatially accurate, high resolution imagery to be used in the creation of other data layers, including the parcel layer. This Aerial Photography layer is also a primary base layer.

*Supplemental Information:*

These orthophotos were produced from an aerial flight in March 2001. Mapping scale is 1"=200' (1:2400). Negative scale of the photography is 1"=1200'.

Note: Many of the entries in this sample metadata record were based upon actual information found within Henderson County's and Johnston County's metadata records. Thanks to both North Carolina Counties for allowing their metadata records to be referenced for this sample.

*Time Period of Content:*

*Time Period Information:*

*Range of Dates/Times:*

*Beginning Date:* 20040301

*Ending Date:* 20040309

*Currentness\_Reference*: publication date

*Status*:

*Progress*: Complete

*Maintenance\_and\_Update\_Frequency*: Unknown

*Spatial\_Domain*:

*Bounding\_Coordinates*:

*West\_Bounding\_Coordinate*: -82.745135

*East\_Bounding\_Coordinate*: -82.249892

*North\_Bounding\_Coordinate*: 35.502228

*South\_Bounding\_Coordinate*: 35.140195

*Keywords*:

*Theme*:

*Theme\_Keyword\_Thesaurus*: None

*Theme\_Keyword*: Orthophotos

*Theme\_Keyword*: Digital Ortho

*Theme\_Keyword*: Photography

*Theme\_Keyword*: Photo

*Theme\_Keyword*: Ortho

*Theme\_Keyword*: Orthophotography

*Theme\_Keyword*: Aerial Photography

*Theme\_Keyword*: Orthoimagery

*Theme\_Keyword*: Ortho Photo

*Theme*:

*Theme\_Keyword\_Thesaurus*: ISO 19115 Topic Category

*Theme\_Keyword*: imageryBaseMapsEarthCover

*Place*:

*Place\_Keyword\_Thesaurus*: None

*Place\_Keyword*: County A

*Place\_Keyword*: North Carolina

*Access\_Constraints*: None

*Use\_Constraints*:

County A GIS Department shall not be held liable for any errors in this data. This includes errors of omission, commission, errors concerning the content of the data, and relative and positional accuracy of the data. This data cannot be constructed to be a legal document. Primary sources from which this data was compiled must be consulted for verification of information contained in this data. This data may not be resold.

*Point\_of\_Contact*:

*Contact\_Information*:

*Contact\_Organization\_Primary*:

*Contact\_Organization*: County A GIS Department

*Contact\_Position*: GIS Coordinator

*Contact\_Address*:

*Address\_Type*: mailing and physical address

*Address*: 123 Main St

*City*: City A

*State\_or\_Province*: North Carolina

*Postal\_Code*: 12345

*Country*: USA

*Contact\_Voice\_Telephone*: (987) 654-3210

*Contact\_Facsimile\_Telephone*: (123) 456-7890

*Contact\_Electronic\_Mail\_Address*: gisordinator@countya.nc.org

*Hours\_of\_Service*: Monday - Friday 8:00am - 5:00pm

*Contact\_Instructions*: Email is preferred.

*Data\_Set\_Credit*:

Orthophotos were flown and processed by Aerial Photos, Inc under contract to County A, North Carolina.

*Native\_Data\_Set\_Environment*:

*Data\_Quality\_Information:*

*Logical\_Consistency\_Report:*

All orthoimages are individually inspected for content, misalignments along mosaic seamlines, and void areas. No digital image dodging or enhancement was performed. Source information was collected and verified manually during the production process.

*Completeness\_Report:*

All imagery is visually inspected for completeness to ensure that no gaps or image misplacements exist in coverage area. Source photography is leaf-off.

*Positional\_Accuracy:*

*Horizontal\_Positional\_Accuracy:*

*Horizontal\_Positional\_Accuracy\_Report:*

Map horizontal accuracy: the limiting RMSE is 4' in x or y; meets or exceeds ASPRS Class II Accuracy Standards

*Lineage:*

*Process\_Step:*

*Process\_Description:*

Each image was scanned from film-stable source at a resolution of 20 micrometers. Airborne GPS provided the camera station X, Y, and Z coordinates and was used as control. Available ground control was used to test the results of the aerotriangulation adjustment. External orientation parameters derived from the aerotriangulation solution were used to provide the horizontal control for each photograph. Vertical control for the orthorectification process was obtained from both LIDAR and existing Digital Elevation Models (DEM). During the orthorectification process, elevation data were extracted and resampled to meet user-specified intervals and bounds. Orthophoto creation complies with "2004, Land Records Management Program Mapping Specifications."

*Process\_Date:* 20020310

*Process\_Contact:*

*Contact\_Information:*

*Contact\_Organization\_Primary:*

*Contact\_Organization:* Aerial Photos, Inc

*Contact\_Position:* Land Surveyor

*Contact\_Address:*

*Address\_Type:* mailing and physical address

*Address:* 555 Church St

*City:* City A

*State\_or\_Province:* North Carolina

*Postal\_Code:* 12345

*Country:* USA

*Contact\_Voice\_Telephone:* (333) 222-1111

*Contact\_Facsimile\_Telephone:* (333) 111-2222

*Contact\_Electronic\_Mail\_Address:* landsurveyor@aerialphotos.org

*Hours\_of\_Service:* Monday - Friday 8:00am - 5:00pm

*Contact\_Instructions:* Email is preferred.

*Cloud\_Cover:* 0-5%

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*Spatial\_Data\_Organization\_Information:*

*Indirect\_Spatial\_Reference:* 37089

*Direct\_Spatial\_Reference\_Method:* Raster

*Raster\_Object\_Information:*

*Raster\_Object\_Type:* Pixel

*Row\_Count:* 130000

*Column\_Count:* 145000

*Vertical\_Count:* 1

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*Spatial\_Reference\_Information:*

*Horizontal\_Coordinate\_System\_Definition:*

*Planar:*

*Grid\_Coordinate\_System:*

*Grid\_Coordinate\_System\_Name:* State Plane Coordinate System 1983

*State\_Plane\_Coordinate\_System:*

*SPCS\_Zone\_Identifier:* 3200

*Lambert\_Conformal\_Conic:*

*Standard\_Parallel:* 34.333333

*Standard\_Parallel:* 36.166667

*Longitude\_of\_Central\_Meridian:* -79.000000

*Latitude\_of\_Projection\_Origin:* 33.750000

*False\_Easting:* 2000000.002617

*False\_Northing:* 0.000000

*Planar\_Coordinate\_Information:*

*Planar\_Coordinate\_Encoding\_Method:* coordinate pair

*Coordinate\_Representation:*

*Abscissa\_Resolution:* 0.000256

*Ordinate\_Resolution:* 0.000256

*Planar\_Distance\_Units:* US Survey Feet (1 meter = 3.2808333333 feet)

*Geodetic\_Model:*

*Horizontal\_Datum\_Name:* North American Datum of 1983

*Ellipsoid\_Name:* Geodetic Reference System 80

*Semi-major\_Axis:* 6378137.000000

*Denominator\_of\_Flattening\_Ratio:* 298.257222

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*Entity\_and\_Attribute\_Information:*

*Detailed\_Description:*

*Entity\_Type:*

*Entity\_Type\_Label:* Black and White MrSID Raster Mosaic

*Entity\_Type\_Definition:* County-wide compilation of 1-foot pixel images

*Entity\_Type\_Definition\_Source:*

Multiresolution Seamless Image Database (MrSID). A compression technique designed specifically for maintaining the quality of large images. Allows for a high compression ratio and fast access to large amounts of data at any scale.

*Attribute:*

*Attribute\_Label:* ObjectID

*Attribute\_Definition:* Internal Feature Number

*Attribute\_Definition\_Source:* ESRI

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:*

Sequential unique whole numbers that are automatically generated.

*Attribute:*

*Attribute\_Label:* Value

*Attribute\_Definition:* Number from 0 to 255 indicating shade of pixel

*Attribute\_Definition\_Source:* County A GIS Department

*Attribute\_Domain\_Values:*

*Range\_Domain:*

*Range\_Domain\_Minimum:* 0

*Range\_Domain\_Maximum:* 255

*Attribute:*

*Attribute\_Label:* Count

*Attribute\_Definition:* Number of pixels with that value

*Attribute\_Definition\_Source:* County A GIS Department

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain*: The count of pixels for a certain value is unique.

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*Distribution\_Information*:

*Distributor*:

*Contact\_Information*:

*Contact\_Organization\_Primary*:

*Contact\_Organization*: County A GIS Department

*Contact\_Position*: GIS Coordinator

*Contact\_Address*:

*Address\_Type*: mailing and physical address

*Address*: 123 Main St

*City*: City A

*State\_or\_Province*: North Carolina

*Postal\_Code*: 12345

*Country*: USA

*Contact\_Voice\_Telephone*: (987) 654-3210

*Contact\_Facsimile\_Telephone*: (123) 456-7890

*Contact\_Electronic\_Mail\_Address*: gisordinator@countya.nc.org

*Hours\_of\_Service*: Monday - Friday 8:00am - 5:00pm

*Contact\_Instructions*: Email is preferred.

*Resource\_Description*:

Downloadable Data: <<http://www.countya.nc.org/gis/download.html>>

*Distribution\_Liability*:

County A GIS Department is charged with the development and maintenance of the county's corporate geographic database and, in cooperation with other mapping organizations, is committed to offering its users accurate, useful, and current information about the county. Although every effort has been made to ensure the accuracy of information, errors and conditions originating from physical sources used to develop the database may be reflected in the data supplied. The user must be aware of the data conditions and bear responsibility for the appropriate use of the information with respect to possible errors, original map scale, collection methodology, currency of date, and other conditions specific to certain data. The use of trade names or commercial products does not constitute their endorsement by the county. Data may not be resold.

See the Disclaimer: <<http://www.countya.nc.org/gis/disclaimer.html>>

*Standard\_Order\_Process*:

*Digital\_Form*:

*Digital\_Transfer\_Information*:

*Format\_Name*: ArcGIS Shapefile

*Transfer\_Size*: 416.878

*Digital\_Transfer\_Option*:

*Online\_Option*:

*Computer\_Contact\_Information*:

*Network\_Address*:

*Network\_Resource\_Name*: <<http://www.countya.nc.org/gis/download.html>>

*Digital\_Form*:

*Digital\_Transfer\_Information*:

*Format\_Name*: ArcGIS Shapefile

*Transfer\_Size*: 416.878

*Digital\_Transfer\_Option*:

*Offline\_Option*:

*Offline\_Media*: CD-ROM

*Recording\_Format*: ISO 9660

*Compatibility\_Information*: Data CD for the most compatibility

*Fees*: Please contact distributor for pricing information

*Ordering\_Instructions*: Contact distributor via email requests.

*Turnaround*: Turnaround times are dependent upon the project.

*Custom\_Order\_Process*: Please contact distributor for ordering information

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*Metadata\_Reference\_Information*:

*Metadata\_Date*: 20040806

*Metadata\_Future\_Review\_Date*: 20040713

*Metadata\_Contact*:

*Contact\_Information*:

*Contact\_Organization\_Primary*:

*Contact\_Organization*: County A GIS Department

*Contact\_Position*: GIS Coordinator

*Contact\_Address*:

*Address\_Type*: mailing and physical address

*Address*: 123 Main St

*City*: City A

*State\_or\_Province*: North Carolina

*Postal\_Code*: 12345

*Country*: USA

*Contact\_Voice\_Telephone*: (987) 654-3210

*Contact\_Facsimile\_Telephone*: (123) 456-7890

*Contact\_Electronic\_Mail\_Address*: gisordinator@countya.nc.org

*Hours\_of\_Service*: Monday - Friday 8:00am - 5:00pm

*Contact\_Instructions*: Email is preferred.

*Metadata\_Standard\_Name*: FGDC Content Standards for Digital Geospatial Metadata

*Metadata\_Standard\_Version*: FGDC-STD-001-1998

*Metadata\_Time\_Convention*: local time

*November 10, 2004*

**Amendment to the Digital Orthophoto Standard**

**Digital Sensor:**

A digital sensor (digital camera) may be used instead of a traditional aerial camera and film for the project with the expressed written consent of the Contracting Officer. The Contractor must describe in writing to the Contracting Officer the specifications of the sensor to be used and how the sensor will meet or exceed all of the traditional camera and film requirements for digital orthophotos.

*Amendment adopted 11/10/2004 by the NC Geographic Information Coordinating Council.  
The Digital Orthophoto Standard was originally adopted 8/18/2004.*