REQUEST FOR PROPOSAL

SOLICITATION NUMBER: USDA-NAIP-3-07

U.S. Department of Agriculture (USDA)
NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP)

U.S. DEPARTMENT OF AGRICULTURE
FARM SERVICE AGENCY
AERIAL PHOTOGRAPHY FIELD OFFICE

NOTICE TO OFFEROR

Any proposal submitted for this RFP must be identified with the following information labeled on the outside of the mailing package:

SOL.NO: USDA-NAIP-3-07
DUE DATE: 21-MAR-2007, 4:30 PM
RECEIVING OFFICE: CONTRACTS

Mail To: AERIAL PHOTOGRAPHY FIELD OFFICE
CONTRACTING OFFICER
2222 WEST 2300 SOUTH
SALT LAKE CITY UTAH 84119-2020

NOTICE TO PROSPECTIVE OFFERORS :

This solicitation is for an Indefinite Delivery Indefinite Quantity (IDIQ), fixed-price contract. The contract covers the base year (2007) and four option years (2008 through 2011). Prospective contractors are instructed to submit a single proposal in response to solicitation USDA-NAIP-3-07 and the task order solicitation NAIP-TO-3-07-1. Proposals will be evaluated based on the combined response to both documents. Contracts will be awarded prior to award of any task orders. Task orders are the method by which project item areas are awarded. See Section L of the contract for proposal preparation instructions.

Any proposal submitted in response to this procurement must be presented in two separate parts, a pricing proposal and a technical proposal. The pricing proposal shall contain two signed documents, the contract form SF-33 (page 1 of this RFP), and the task order pricing proposal (pages 1-3 of the task order RFP).

The technical proposal shall respond to information requested herein and shall be limited in size to a maximum of 100 double-sided pages. Please do not secure the technical proposal using a “plastic comb” or spiral type bindings (3-ring binders are preferred). Do not include any pricing or cost information in the technical proposal. Attachments that contain reference material may be submitted has separate documentation and will not be counted toward the page limitation.

The Government’s obligation under this procurement is contingent upon the availability of funds from which payment for contract purposes can be made. No legal liability on the part of the Government for any payment, other than the minimum guaranteed amount, may arise until funds are made available to the Contracting Officer for all or part of the task order requirements.

The complete text of any or all clauses referenced herein may be obtained by submitting a request, identifying this solicitation number, to the Contracting Officer, USDA, FSA, Aerial Photography Field Office, 2222 West 2300 South, Salt Lake City, Utah 84119-2020. Complete copies of the FAR in loose-leaf or CFR form may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington D.C. 20402.

SOLICITATION, OFFER AND AWARD

1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700) ▶ RATING

2. CONTRACT NUMBER	3. SOLICITATION NUMBER	4. TYPE OF SOLICITATION	5. DATE ISSUED	6. REQUISITION/PURCHASE NUMBER
	USDA-NAIP-3-07	☐ SEALED BID (IFB) ☒ NEGOTIATED (RFP)	02-16-07	

7. ISSUED BY CODE

USDA-FSA-Aerial Photography Field Office
2222 West 2300 South
Salt Lake City, UT 84119

8. ADDRESS OFFER TO *(If other than Item 7)*

Contracting Officer, USDA/FSA-APFO
2222 West 2300 South
Salt Lake City, UT 84119

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

SOLICITATION

9. Sealed offers in original and _____ copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if handcarried, in the depository located in Rm. 10, Aerial Photography Field Office until _____ *(Hour)* local time 03-21-07 *(Date)*

CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-1. All offers are subject to all terms and conditions contained in this solicitation.

10. FOR INFORMATION CALL:	A. NAME	B. TELEPHONE *(NO COLLECT CALLS)*			C. E-MAIL ADDRESS
		AREA CODE	NUMBER	EXT.	
	W. Geoffrey Gabbott	801	975-3500	207	

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OFFER *(Must be fully completed by offeror)*

NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.

12. In compliance with the above, the undersigned agrees, if this offer is accepted within _____ calendar days *(60 calendar days unless a different period is inserted by the offeror)* from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule.

13. DISCOUNT FOR PROMPT PAYMENT *(See Section I, Clause No. 52.232-8)*	10 CALENDAR DAYS (%)	20 CALENDAR DAYS (%)	30 CALENDAR DAYS (%)	CALENDAR DAYS (%)

14. ACKNOWLEDGMENT OF AMENDMENTS *(The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated)*:	AMENDMENT NO.	DATE	AMENDMENT NO.	DATE

15A. NAME AND ADDRESS OF OFFEROR — CODE _____ FACILITY _____

16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER *(Type or print)*

15B. TELEPHONE NUMBER			15C. CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE.	17. SIGNATURE	18. OFFER DATE
AREA CODE	NUMBER	EXT.	☐		

AWARD *(To be completed by Government)*

19. ACCEPTED AS TO ITEMS NUMBERED	20. AMOUNT	21. ACCOUNTING AND APPROPRIATION

22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION:
☐ 10 U.S.C. 2304(c)) ☐ 41 U.S.C. 253(c) ( )

23. SUBMIT INVOICES TO ADDRESS SHOWN IN *(4 copies unless otherwise specified)* ▶ ITEM

24. ADMINISTERED BY *(If other than Item 7)* CODE _____

25. PAYMENT WILL BE MADE BY CODE _____

26. NAME OF CONTRACTING OFFICER *(Type or print)*

27. UNITED STATES OF AMERICA
(Signature of Contracting Officer)

28. AWARD DATE

IMPORTANT - Award will be made on this Form, or on Standard Form 26, or by other authorized official written notice.

PART I - THE SCHEDULE

SECTION B - SUPPLIES OR SERVICES AND PRICES/COSTS

B-1 AERIAL PHOTOGRAPHY AND DIGITAL IMAGERY SERVICES

This is a performanced-based procurement for nationwide orthophotography designed to promote economy and efficiency of image acquisition and processing by providing offerors flexibility in the equipment used, procedures employed, selection of areas of interest, and quantity of project item areas proposed. Requirements for this contract are to furnish aerial photography and direct digital imagery services and all related services and supplies in accordance with the requirements, specifications, terms, conditions, clauses, and provisions specified herein. This is a single year indefinite-delivery, indefinite-quantity (IDIQ) contract with four option years, effective for the contract performance periods stated in the schedule. The project item areas, quantities, and other parameters will be listed in the individual task order. In the event of conflict between the requirements listed herein and the awarded task order, the contents of this contract shall take precedence.

1.1 Intended use of Products

NAIP imagery is available for distribution within 60 days of the end of flying season and is intended to provide current information of agricultural conditions in support of USDA farm programs. For USDA Farm Service Agency, the 1 meter GSD product provides an ortho image base for Common Land Unit boundaries and other data sets. The 1 meter NAIP imagery is generally acquired in projects covering full states in cooperation with state government and other federal agencies, who use the imagery for a variety of purposes, including land use planning and natural resource assessment. With an annual cycle, NAIP also is used for disaster response, often providing the most current pre-event imagery. While suitable for a variety of uses as well, the 2 meter GSD NAIP imagery is primarily intended to assess crop condition and compliance to USDA farm program conditions. The 2 meter imagery is generally acquired only for agricultural areas of state projects.

1.2 Importance of Timely Image Acquisition and Product Delivery

The principal objective of this contract is to provide timely imagery to USDA Service Centers acquired during peak agriculture growing season(s). Imagery not acquired during the Government identified acquisition period or data products not delivered within the requirements specified herein will significantly impact the Government's ability to complete its mission. Materials not meeting the minimum schedule requirements will be subject to price reduction based on the diminished usability of the product. Due to the time constraints of this procurement, , the Government reserves the right to impose price reductions without allowing the Contractor a chance to reacquire or reprocess the imagery.

1.3 Importance of Image Quality

Any imagery submitted to the Government that does not meet the minimum quality requirements may impact the Government's ability to properly use the imagery for its intended purpose and may be subject to a price reduction based on the diminished usability of the product.

1.3 Optional Award Item

Optional award items for alternate methods of acquiring or delivering imagery may be submitted and will be reviewed by the Government.

B-2 MINIMUM PROJECT REQUIREMENTS

2.1 General Requirements

(a) The following contract deliverables shall be prepared and submitted by the Contractor in accordance with the requirements identified in the task order:

(1) Compressed County Mosaics
(2) Quarter Quadrangle Image Tiles
(3) Accuracy and Quality Control Reports (1-meter only)
(4) Original Aerial Film (aerial photography only)
(5) Progress Reports
(6) Project Data Files (some are for aerial photography only)
(7) Other metadata requirements

(b) All contract materials shall be prepared in accordance with specifications and work statement (Section C), packaging and marking (Section D), inspection and acceptance (Section E), and delivery schedule (Section F) requirements.

(c) A product warranty shall be provided on all deliverables in accordance with Section I-8, Warranty of Supplies of a Noncomplex Nature.

2.2 Project Flight Planning

The contractor is responsible for all necessary flight planning, including, but not limited to determination of photographic scale, exposure stations, altitudes, and flight directions, required to acquire the imagery. See section C-5.2, Flight Planning.

2.3 Imagery Acquisition

(a) Film-based Acquisition. Film-based acquisitions require the Contractor to comply with the technical requirements and specifications of this contract, and Attachment A:

NAIP Specification for Film Based Acquisition which defines the essential elements in securing high quality aerial photography and scanned imagery.

(b) Digital Camera/Sensor Acquisition. Digital sensor acquisitions require the Contractor to comply with the technical requirements and specifications of this contract, and Attachment B: Specification for Digital Sensor Based Acquisition which defines the essential elements in securing high quality direct digital imagery. The digital sensor system shall be a tested, stable, geometrically calibrated system with appropriate documentation, suitable for use in precision photogrammetric orthoimagery applications.

2.4 Priorities for Project Item Areas

The Contracting Officer may direct, by written order, certain project item areas or regions within those areas listed under a Contract Award Item to be acquired in a priority order, weather and ground conditions permitting. All reasonable effort will be directed toward providing a schedule of operations favorable to both the Government and Contractor.

B-3 GOVERNMENT-FURNISHED PROPERTY

Pursuant to the Government-Furnished Property (GFP) clause (see Section I-9) the Government shall only furnish items of property listed below or identified in the individual task orders.

3.1 Metadata Template

The Contractor will be furnished upon award two (2) data text files (.txt) containing Federal Geographic Data Committee (FGDC) compliant metadata template to be used when creating the Compressed County Mosaic (CCM) and CCM shapefile metadata as required in Section C-6.3(d).

3.2 Sample Imagery

The contractor will be furnished upon award photographic-quality paper copies of “radiometric corrected” imagery samples that represents the Government’s desired color and tonal balance for a given project item area. Some states with varying types of terrain may have multiple image samples representative of terrain types. The supplied imagery sample should be used as a target image for that state’s digital imagery production as required in Section C-6.2.

B-4 TASK ORDERS

4.1 Task Order Quantities

Awarded quantities shall be made by issuance of authorized task orders in accordance with specified ordering procedures. The quantities of services and supplies specified in the task order Request for Proposals (RFPs) are estimates only. See Section I-2, Ordering, and Section L-3, Task Order Procedures.

4.2 Minimum Task Order Award

The guaranteed minimum amount for the NAIP contract shall be a total of $2,500.00, as met through the issuance of one or more task orders within the contract performance period as stated in Section B-4.3 below. See Section I-5, Order Limitations.

4.3 Contract Performance Period

(a) The contract performance period for the Base Year (FY2007) for issuance of task orders is: **Date of Award through December 31, 2007**.

(b) The contract performance period for the option years are:

Option year 1	(FY2008)	**January 1 through December 31, 2008**
Option year 2	(FY2009)	**January 1 through December 31, 2009**
Option year 3	(FY2010)	**January 1 through December 31, 2010**
Option year 4	(FY2011)	**January 1 through December 31, 2011**

(c) The Government solely reserves the right to exercise the option to extend the term of the contract for option years 1 thru 4 based on the evaluation of contractors past performance on previous task orders awarded during the preceding contract performance period (See Section F-5.4, Option to Extend the Term of the Contract). The guaranteed minimum amount does not apply to option years that have not been exercised by the Government.

4.4 Delivery Order Authorization

Only authorized contracting officers from USDA-FSA-Aerial Photography Field Office have authority to issue task orders for the purchase of product and services under this contract. Oral orders are not authorized under this contract.

4.5 Task Order Ombudsman

The Director of USDA-FSA-Aerial Photography Field Office shall serve as the Task Order Ombudsman responsible for reviewing complaints from the contractors and ensuring that all of the contractors are afforded a fair opportunity to be considered for task orders issued under this contract. The task order Ombudsman may be contacted at telephone (801) 975-3500 ext. 205, or mail to: Director, APFO, 2222 West 2300 South, Salt Lake City, UT 84119.

PART I - THE SCHEDULE

SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

C-1 SCOPE OF CONTRACT

The general scope of the contract is to procure precise current year digital orthoimagery. The orthoimagery will be used in the administration of FSA Compliance Programs and to update the USDA GIS Orthoimagery Base program. Other multi-agency program uses include, but are not limited to agriculture land use analysis, natural resource inventory, and extraction of data by means of photogrammetric measurements.

1.1 Introduction

The Contractor is responsible for furnishing aerial photography and/or direct digital imagery services and related services and supplies in accordance with requirements, specifications, terms and conditions specified herein.

(a) Technical Requirements and Specifications

The technical requirements and specifications of this contract are described in this section and Attachments A, B and C, which define the essential elements in securing high quality digital orthoimagery. Any deviation from the specifications stated herein may cause increased time and effort in using the imagery as intended.

(b) Delivery and Performance

The delivery and performance requirements of this contract are described in Section F, Deliveries or Performance. All contract materials shall be shipped within the time limits and to the place of delivery specified herein. Performance of the contract shall be authorized and monitored by the Contracting Officer and/or the Contracting Officer's Representative.

(c) Quality Control

Quality control shall be exercised by the Contractor continuously throughout the performance of the contract, see Section C-8, Quality Control.

1.2 Location of Work

The project item area(s), quantities, and acquisition periods will be identified in the individual task orders. The Contractor’s place of performance where work will be performed on this contract shall be indicated in ORCA Certification.

1.3 Project Management and Flight Planning

The Contractor is required to provide the necessary project management, coordination, and supervision to conduct project planning, flight planning and acquisition, image processing, product delivery, and related technical and progress reports as required in the contract (see Section C-7, Project Management).

1.4 Labor and Materials

The Contractor shall furnish all materials, equipment, transportation, superintendence, and labor as required herein. The Contractor shall execute and finish the imagery acquisition, orthoimagery production and related services for the project specified and shall deliver to the USDA all materials called for in Section F-1, Materials to be Delivered.

C-2 APPLICABLE DOCUMENTS

2.1 Attachments

The following documents attached to this solicitation document are considered requirements and specifications under the resulting contract(s), as applicable to the Contractor's technical proposal:

(a) National Agriculture Imagery Program (NAIP) Specification for Film Based Acquisition, dated February 16, 2007 (Attachment A)
(b) National Agriculture Imagery Program (NAIP) Specification for Digital Sensor Based Acquisition, dated February 16, 2007 (Attachment B)
(c) Digital Orthoimagery Quarter-Quadrangle (DOQQ) Description and Specification, dated February 16, 2007 (Attachment C)

2.2 References

The following documents referenced in this solicitation document are considered requirements and specifications under the resulting contract(s), as applicable to the Contractor's technical proposal:

(a) Federal Geographic Data Committee (FGDC) Specification, FGDC-STD-001-1998 ("Content Standard for Digital Geospatial Metadata")
(b) Code of Federal Regulation (CFR) Title 14 ("Federal Aviation Regulations")
(c) GeoTIFF Revision 1.0 Specification, dated December 28, 2000 (Version 1.8.2)
(d) TIFF Specification Revision 6 dated June 3, 1992 (Adobe Systems Inc.)

C-3 GENERAL REQUIREMENTS

The Contractor shall furnish all materials, equipment, transportation, superintendence, and labor required to plan, acquire, manage, process, and orthorectify aerial photographs and digital imagery for the project item areas and requirements specified in the individual task orders.

C-4 EQUIPMENT REQUIREMENTS

Any equipment (aircraft and cameras/sensors, in addition to those submitted at the time of task order offer) proposed to be used by the Contractor must be approved for use by the Contracting Officer. If the aircraft and camera/sensor proposed for use are not owned by the Contractor, a written statement of availability from the owner of the equipment shall be furnished to the Contracting Officer (see individual task order requirements).

4.1 Precision Aerial Mapping Camera/Digital Sensor

Tested and calibrated precision aerial cameras and digital sensors for acquiring aerial photographs/imagery are required and must meet contract specifications (see Attachments A and B). Camera systems must be compatible with precision stereoscopic mapping instruments and with analytical mensuration procedures used in photogrammetric surveys and in preparing accurate orthoimagery.

(a) Camera/Sensor Evaluation

Proposed film camera systems will be evaluated to determine if they meet the contract specifications, based on a current USGS camera calibration test report. Proposed digital sensor systems will be evaluated to determine if they meet the contract specifications, based on current technical descriptions and samples. The Contracting Officer shall have the right to require the removal of a camera/sensor from use when deficiencies in imagery attributable to the camera are found to exist. Any camera/ sensor removed from use by the Contracting Officer shall not be returned to use on any APFO contract until the cause of the malfunction is corrected to the satisfaction of the Contracting Officer. That determination will be based on acceptable samples, calibration reports, and/or an additional test by the Optical Science Laboratory of the USGS, if directed by the Contracting Officer.

(b) Camera/Sensor Operation

The camera/sensor and its mount shall be checked for proper installation prior to each mission. In conformance with conventional photogrammetric practice, it is the preference of the Government that the Contractor use camera/sensor configurations, that when in use, advance film/imagery parallel to the line of flight.

(c) Camera Accessories

Automatic Exposure Control. An automatic exposure control device is permitted, but a manual override capability is required for some types of terrain to achieve proper exposure.

Camera Mount. The camera mount shall be regularly serviced and maintained and shall be insulated against aircraft vibration.
Camera Port Glass. Aircraft camera port glass shall be preferably 50mm thick but not less than 32mm thick. The surface finish shall be 80/50 or better. Glass material shall be polished crown, group category M, Mil Specs Mil-W-1366F (ASG), dated October 1975, C-1 optical quality or better.

4.2 Aircraft Requirements

(a) FAA Certification

All aircraft used in the performance of this contract shall be maintained and operated in accordance with all regulations required by the U.S. Department of Transportation, Federal Aviation Administration (FAA). Aircraft operated in the acquisition of aerial photography or digital imagery under this contract shall be FAA certified to a service ceiling with operating load (crew, camera, film, oxygen, and other required equipment) of not less than the highest altitude required.

(b) Positive Control Airspace

The project item areas may contain areas of controlled or restricted airspace. It is the responsibility of the Contractor to obtain all approvals necessary to assure that required clearances are achieved. When the flight plan and location of any project area coverage fall within positive-control airspace, the aircraft must contain the appropriate equipment to operate in such positive-control areas within the purview of the Federal Aviation Regulations. In addition to all FAA requirements, all flights requesting clearance in the vicinity of “VIP” type airspace with Temporary Flight Restrictions (TFR) shall notify the Contracting Officer prior to receiving FAA clearance for instructions. (See Section H-1, Permits and Clearances.)

(c) Aircraft Configuration

The design of the aircraft shall be such that when the camera is mounted with all its parts within the outer structure, an unobstructed field of view is obtained. The field of view shall be shielded from the exhaust gases, oil, effluence, and air turbulence. The camera port glass shall be free of scratches and of such quality that it will not degrade the resolution or the accuracy of the camera and shall conform to Section C-4.1(c), Camera Port Glass.

C-5 IMAGERY ACQUISITION REQUIREMENTS

5.1 Photographic Conditions

Imagery shall be acquired when skies are clear, free from smoke or excessive haze, and well-defined images can be resolved. DOQQ image tiles with greater than ten percent (10%) cloud cover or cloud shadows will not be acceptable. The ground shall be free from standing water (other than natural or man-made ponds and lakes), flood waters from streams which have overflowed their banks, and wet ground which obscures field, soil or crop lines. The Contractor shall minimize specular reflections, especially in agriculture areas, by patching the area using imagery from other frames.

5.2 Flight Planning

The Contractor shall provide flight line planning necessary to acquire precision, high quality imagery for the production of digital quarter quadrangle centered orthoimagery, which shall include at a minimum, exposure stations, flight altitude determinations, and overlap stereoscopic coverage.

5.3 Flight Requirements

The Contractor shall obtain precise vertical aerial photography or digital imagery in accordance with the following technical requirements:

(a) Acquisition Periods. The Contractor shall acquire imagery only during that portion of the day when the sun angle exceeds the minimum thirty degrees (30º). The Contractor shall limit operations to the dates specified in the individual task order or as otherwise provided in writing by the Contracting Officer as stated under Section F-5, Performance of the Work.

(b) Tilt. It is desired that exposures be made when the optical axis of the camera/sensor is in a vertical position. The Contractor shall not acquire imagery when the tilt (departure from the vertical) of any exposure exceeds four degrees (4º) or relative tilt between any two successive exposures which exceed six degrees (6º). Tilt shall not average more than two degrees (2º) in any 16 km (10 mile) section of a flight line and shall not average more than one degree (1º) for the entire project.

C-6 DIGITAL IMAGERY PROCESSING

6.1 Digital Orthoimagery

The Contractor is required to provide color and/or color near-infrared digital ortho-rectified imagery at the GSD resolution requirement specified in the individual task order.

6.2 Quarter Quadrangle Image Tiles

Contractor shall provide rectification services to produce digital orthophoto imagery in accordance with Attachment C at the resolution requested in the individual task order. The digital image shall cover the entire image area of one USGS standard quarter quadrangle (QQ), with a 300 meter buffer on all four sides of the QQ and shall be projected in the NAD83 Datum, using corresponding native UTM zone.

(a) Image Quality. All tiles shall meet the image quality requirements specified in Attachment C. The Government's preference is not to have the tiles "radiometrically balanced" with other neighboring tiles. Unless otherwise allowed by the Contractor Officer, radiometric requirements listed in Attachment C shall have priority over matching a Government-furnished sample. The tile shall not contain any borders, artifacts, or other non-image items.

(b) Horizontal Accuracy. Unless otherwise specified in the individual task order, the tiles shall meet the horizontal accuracy requirements listed in Attachment C.

(c) File Format. Unless otherwise specified in the individual task order, the Digital Ortho Quarter Quadrangles (DOQQ) tiles shall be an uncompressed, georeferenced tagged image file format (GeoTIFF).

(d) Digital Elevation Model (DEM). Contractor shall use the most current/recent version of USGS National Elevation Database (NED) for terrain-correcting the imagery. The NED dataset used by the Contractor during tile production shall be current as of the date of task award. The Government's preference is the use of the highest resolution NED dataset available when producing NAIP imagery.

(e) Image Source. The Contractor may use imagery from multiple exposures, i.e., using the "sweet spot" from both odd and even stations during film acquisition, when creating the tile images. Using "chips" (imagery pieces from other frames) to correct defects is also permitted. All exposures shall be from the same type of sensor and must be from same acquisition season. When multiple exposures are used in creating a tile, the acquisition date with the largest area shall be used when reporting dates in a single date field, such as metadata or attribute data. An average or mean date shall not be used.

(f) Preproduction Sample. For each project item area, the Contractor shall submit a single radiometric corrected image within 21 days of the first image acquisition for Government review. The sample shall be a TIFF (GeoTIFF) preferred, and submitted on a standard CD or DVD (labeling requirements in Section E are not required). The Government evaluate and provide approval or disapproval letter with comments no later than 3 business days, with a goal of 24 hours. Additional project item area samples may be submitted for review if approved by the Contracting Officer Representative (COR).

6.3 Compressed County Mosaics

The Contractor shall produce compressed county mosaic (CCM) files using the imagery associated with the tiles created in Section C-6.2, Quarter Quadrangle Image Tiles. For counties that are split by UTM zone lines, the county shall be re-projected to the UTM zone listed in the individual task order.

(a) Image Quality. The Contractor shall tone balance the composite DOQQs to give the CCM a consistent and uniform image quality appearance that eliminates a checkerboard effect. The resulting CCM should maintain as much of the original color and appearance of the color corrected tiles as practical.

(b) Horizontal Accuracy. The accuracy requirements from C-6.2(b) shall be preserved when creating the CCM using the imagery associated with the quarter quadrangle tiles

(c) File Format. The CCMs shall be compressed using the compression format specified in the individual task order.

(d) Metadata and Related Information.

(1) The Contractor shall create a Federal Geographic Data Committee (FGDC) compliant, per the FGDC-STD-001-1998 specification, metadata file using the Government provided template for each CCM generated. The metadata must parse cleanly through the USGS metadata parser “mp” version 2.8.10 (or later version) without any errors.

(2) Shapefile. The Contractor shall provide a county-based CCM polygon shapefile index in accordance with the individual task order.

6.4 Regional Settings

All digital files, including imagery and metadata, shall be created using standard ANSI English-US setting. For example, periods (“.”) shall be used to separate the whole number from the fractional portion when recording decimal numbers, and data representing a long date shall be recorded as “Wednesday, August 17, 2005 5:09:38 PM.”

C-7 PROJECT MANAGEMENT

The Contractor shall establish and maintain a project management system with a designated project manager for this effort. Project management consists of those activities required to plan, manage, administer, and control efforts to accomplish the objective of the contract. The project manager will serve as the primary point of contact for the Contractor’s activity with the Government. The project manager’s name and contact information shall be identified, in writing, to the Contracting Officer within 20 days of contract award.

7.1 Progress Reports

A Progress Report is required for each day progress is made in acquiring project photography. Reports shall be transmitted by e-mail following each day of progress. E-mail address will be provided at contract award. See Section F-5.2 for instructions and Section J, Exhibit 3, Progress Report for syntax and example.

7.2 Subcontract Management

If the Contractor uses subcontractors in the performance of the contract, a plan and procedure will be established to manage its subcontractors. Contractor should give prior notification of any subcontracts in accordance with G-4, Subcontracts. The Contractor is encouraged to maximize its use of partnerships and subcontractors to accomplish the requirements of this contract. However, the Contractor is solely responsible for the performance and cost control of its partnerships and subcontractors.

7.3 Project Data Files

(a) Production Process. The Contractor shall create brief descriptions of the digital image processing system which shall include a narrative explanation of the process steps taken to produce the imagery in accordance with Section F-1.6(a) and the FGDC specification, paragraph 2.5.2.1, Process Description. Separate descriptions are required for the quarter quadrangle image tiles and CCM.

(b) Project Data Files. The Contractor shall create a project description file in accordance with Section F-1.6(b) of this contract and at a minimum include the following data:

Description:
Project Item Area (name as it appears in the task order)
Contract Award Number (to be assigned upon award, USDA-NAIP-3-07-1)
State (2-letter USPS state abbreviation - MO, KS, etc.)
Nominal Photo Scale
Nominal Lens Focal Length
Film Type (CP, CIRP, DIGITAL)
Number of Film Rolls (as applicable)
Coordinate System Datum
Date Photo-Center Data File was created (YYYYMMDD)
Scanner Manufacturer and Model Number: "Free text with quotations" (50 characters max)
Ortho Rectification System used to produce images: "Free text with quotations" (50 characters max)

Example:
Missouri,USDA-NAIP-3-07-1,MO,1:40,000,153mm,CP,35,NAD83, 20040801,"LHS XXXXX Photogrammetric Scanner", "production

hardware & software description"

(c) Photo-Center Data File. The Contractor shall create a photo-center data file for delivery under this contract in accordance with Attachment A, paragraph 6.1 (film-based acquisition only) or Attachment B, paragraph 5.1 (digital capture acquisition only).

(d) Scan Data File. The Contractor shall create a scan data file (film-based acquisition only) listing all scanned images in accordance with Attachment A, paragraph 6.2

C-8 QUALITY CONTROL

Quality control shall be exercised by the Contractor continuously throughout the performance of the contract. Procedures shall be established to assure that all contract materials are delivered in accordance with the delivery schedule and at the required level of accuracy and quality. The Contractor shall inspect and constantly monitor the image quality and coverage, and shall undertake immediate reflights of any imagery where the quality fails to meet minimum requirements of the contract specifications. Any marginal photography/imagery submitted for inspection which does not meet minimum requirements may be rejected. The marginal photography may be accepted, at the Government's convenience, but shall be subject to a price reduction based on the diminished utility of the product. The nature and urgency of this project may require the Government to make equitable financial adjustments for materials deemed rejectable or where product use is adversely impacted. USDA inspection and acceptance procedures are described in Section E, Inspection and Acceptance.

8.1 Accuracy and Quality Control Report

The Contractor shall provide RMSE accuracy reports and quality control reports generated during the AT or orthorectification processes for all 1-meter quarter quadrangle image tiles in accordance with Section F-1.3.

PART I - THE SCHEDULE

SECTION D - PACKAGING AND MARKING

D-1 PREPARATION OF MATERIALS FOR SHIPMENT

1.1 Film, Film Cans, and Labels

All film shall be thoroughly cleaned and placed on spools of the specified size stated in Attachment A, Specification for NAIP Film Based Acquisition, with the emulsion facing the core of the spool. The use of any adhesive tape product, such as masking tape, which leaves residual adhesive on the film, is prohibited. All aerial film rolls shall be shipped in sturdy cylindrical plastic cans. Film can labels will be furnished by the APFO. The Contractor is required to prepare a label to be fastened to the outside of each can in accordance with the example in Attachment A.

1.2 Digital Files

All digital imagery and text files shall be labeled and shipped in packaging designed for their protection. The individual task order will specify which digital storage format the files shall be delivered on.

(a) Compact Disks. All compact disks (CDs) shall be delivered on archival media, 700 Megabytes (80-minute) per disk CD-R, hybrid ISO 9660 Mode 1 format using level 2 interchange with Rockridge and Joliet extensions. The format of the CD will allow long file names up to 64 characters in length, and be readable by both Windows and UNIX systems where the file names will appear the same on both systems. The Contractor must insure that each and every copy session has been properly closed. No multi-session enabled CDs will be accepted. The CD media shall have a label attached identifying the digital contents of the CD in accordance with Section J, Exhibit 2, Figures 1 and 2 (thermal printed CDs are acceptable). In addition to the packaging requirements in D-2, all CD media shall be packaged in standard single CD jewel cases (5-5/8" x 4-15/16" x 3/8") with a clear front cover. The CD label shall be readable without opening the case or removing the CD from the case. “Slim” or other non-standard sized jewel cases will not be accepted.

(b) Digital Versatile Disk. All digital versatile disks (DVDs) shall be delivered on archival media, single-sided, 4.7 Gigabyte (120-minutes) DVD-R discs. Other DVD formats, such as DVD-R(A), DVD-RW, DVD+R, or DVD+RW, will not be accepted. DVDs shall meet all other requirements, except for the media type, as specified for CDs (see paragraph above).

Mosaic files too large to fit on a single DVD shall be divided along lines of longitude or latitude through the entire length and or width of the county, with no deviations. Overlapping imagery of one DOQQ shall be provided along both sides of the division.

(c) External Hard Drives. The delivery media for the image files shall be External Combo USB2.0/IEEE1394 (Firewire) hard drives. All external hard drives shall be "Combo" style drives, capable of both USB2.0 and IEEE-1394 (Firewire) connections. The drives shall be formatted using Microsoft's NTFS file system. The drives shall become property of the Government and will not be returned to the Contractor. Each drive shall have a label attached directly to the drive identifying the project contained on the drive in accordance with Section J, Exhibit 3, External Hard Drive Label.

(d) Tape Cartridges. All tapes shall be delivered on Super DLT 1 cartridges using the Quantum SDLT 320 Tape Drive set at native capacity (160 gigabytes). Other tape systems or formats, including hardware compression, will not be accepted. Tape media shall be written using GNU tar utility version 1.13 set at fixed block of 512 bytes and a blocking factor of 128, thus creating a physical record size of 65,536 bytes. No other fixed block size or blocking factor shall be accepted. The tape media and case shall be labeled in accordance with Section J, Exhibit 2, Figure 3. In addition to the packaging requirements in D-2, all tapes shall be packaged in their appropriate case.

D-2 PACKAGING FOR SHIPMENT

All material shall be packed for shipment in such a manner that insures acceptance by common carrier and safe delivery at destination. Containers and closures shall comply with the Interstate Commerce Commission regulations, Uniform Freight Classification rules, or regulations of other carriers as applicable to the mode of transportation. Damaged materials shall be replaced by the Contractor at no cost to the Government.

A packing slip shall accompany each shipment, itemizing all materials included in the shipment.

D-3 SHIPPING RECEIPTS

Receipts from common carriers for shipment of materials shall be retained by the Contractor and made available to the Contracting Officer upon request.

D-4 SHIPPING CONTAINER MARKINGS

All shipping containers shall be clearly marked with the delivery address. See Section F-2.

PART I -THE SCHEDULE

SECTION E - INSPECTION AND ACCEPTANCE

E-1 INSPECTION AND ACCEPTANCE (FEB 1988)(AGAR 452.246-70)

The Contracting Officer or the Contracting Officer's duly authorized representative will inspect and accept the supplies and/or services to be provided under this contract.

Inspection and acceptance will be performed at:

Aerial Photography Field Office
2222 West 2300 South
Salt Lake City, Utah 84119-2020

E-2 INSPECTION PROCEDURE

All materials specified in Section F-1, Materials to be Delivered will be inspected to determine conformance to all contract requirements and specifications. Inspection of the Compressed County Mosaics will be performed utilizing an expedited method of checking general compliance to specifications. Inspection of the Quarter Quadrangle Image Tiles will be performed utilizing a comprehensive method of quality assurance inspection procedures, which includes a random sampling technique to test for compliance to the horizontal accuracy requirement in the imagery delivered. See Section C-6.2(b) and C-6.3(b) for the accuracy standard requirements. (Refer to FAR 52.246-2, Inspection of Supplies-Fixed Price and FAR 52.246-4, Inspection of Services-Fixed Price.)

If the inspection of materials reveals deficiencies that may cause increased time and effort in using the digital imagery and aerial photography as intended, the Government may require the Contractor to perform the services again in conformity with contract requirements, at no increase in contract amount. When the defects in services cannot be corrected by re-performance, the Government may:

(a) Require the Contractor to take necessary action to ensure that future performance conforms to contract requirements and

(b) Reduce the contract price to reflect the reduced value of services performed.

E-3 INSPECTION SCHEDULE

The Government will make every effort to inspect the Compressed County Mosaic material within 30 calendar days after they are received at the point designated. Should the inspection

procedure be delayed longer than 30 days, the Contractor will be notified of the reason(s) for delay and given the estimated completion date. Contract materials will be inspected in the order of their receipt, unless otherwise prioritized by the Government.

The Government will make every effort to inspect the Quarter Quadrangle Image Tiles and related data material within 12 months after they are received at the point designated. Should the inspection procedure be delayed longer than 12 months, the Contractor will be notified of the reason(s) for delay and given the estimated completion date. Contract materials will be inspected in the order of their receipt, unless otherwise prioritized by the Government.

The Contractor will be notified in writing whether the materials are satisfactory and what materials, if any, shall be remade because of non-conformance with contract requirements.

E-4 PRELIMINARY INSPECTION

USDA will perform a comprehensive inspection of all contract materials submitted to determine compliance to contract requirements. A preliminary inspection of the Compressed County Mosaic digital imagery submitted will be prioritized to expedite delivery to users. Based on this preliminary inspection, a contract status report will be generated recording all acceptable county imagery as well as rejectable imagery and the deficiencies discovered. Final acceptance will be determined from the combined inspection results covering all contract materials submitted.

E-5 PARTIAL COVERAGE

If the Contractor obtains only partial coverage for any project item area and/or county during the season, then all partial imagery shall be processed and delivered according to the requirements specified for completed imagery. The requirement for processing partial coverage may be waived only by the Contracting Officer.

E-6 ACCEPTANCE

Final acceptance will be made after inspection by the Government of all required materials delivered at the specified destination. Delivery dates for individual products by project item areas are specified in Section F-3. The acceptance date will be the date of the letter by the Government to the Contractor stating all materials are acceptable and an invoice may be submitted.

Partial acceptance on any fully completed project due to rejection of deficient or non-compliant material will be made based on both preliminary inspection results of the digital imagery and the final inspection results of all remaining materials. A partial acceptance will result in a price reduction based on the final determination of material compliance to contract requirements and specifications.

Partial acceptance on any uncompleted area will be made only after the photographic season has ended and all materials required for the partial area have been delivered, inspected, and accepted by the Government. The acceptance date will be the date of the letter by the Government to the Contractor identifying the amount of partial acceptance and the amount to invoice.

E-7 CLAUSES INCORPORATED BY REFERENCE (FEB 1998) (FAR 52.252-2)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at the following address: www.arnet.gov/far.

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES:

52.246-02 Inspection of Supplies - Fixed Price (AUG 1996)

52.246-04 Inspection of Services - Fixed Price (AUG 1996)

52.246-16 Responsibility for Supplies (APR 1984)

PART I - THE SCHEDULE

SECTION F - DELIVERIES OR PERFORMANCE

F-1 MATERIALS TO BE DELIVERED

The materials as specified in Section B for Project Item Area(s) identified in the individual task orders shall be delivered as required and consist of the following items. The Contractor shall maintain a copy of the digital data until APFO acknowledges receipt. **The Government strongly encourages the Contractor to submit any/all data when it becomes available and not wait for a "complete set" prior to submitting**. This incremental approach will allow the Government to inspect the data more efficiently and provide a more timely acceptance/rejection turnaround to the Contractor.

1.1 COMPRESSED COUNTY MOSAICS

Item	Requirement
Format	See task order
Media	See task order
Naming Convention	See Section J, Exhibit 1 (i.e. naip_1-1_1n_s _mo137_2004_1.sid)
Quantity	Two (2), unless otherwise stated in the task order
Date of First Submittal	No later than thirty (30) calendar days after acquisition period. **Early and/or incremental delivery is highly encouraged to ease USDA program time constraints.**
Submittal Frequency	Once (a second submittal is required if a flying season extension is granted) (See Para 5.3 below)
Government Approval Required	Yes (see Section E)
Required Metadata	Yes (see Section C-6.3)

1.2 QUARTER QUADRANGLE IMAGE TILES

Item	Requirement
Format	GeoTIFF, unless specified in the task order
Media	See task order
Naming Convention	See Section J, Exhibit 1 (i.e. "c_3509320_ne_15_1_20040721.tif")
Quantity	One (1)
Date of First Submittal	No later than 45 calendar days after acquisition period
Submittal Frequency	Once
Government Approval Required	Yes (see Section E)
Required Metadata	No but a Table of Content is required (see Section 6.2)

1.3 RMSE ACCURACY AND QUALITY CONTROL REPORTS (1 METER ONLY)

Item	Requirement
Format	Contractor format (ASCII preferred)
Media	CD-ROM (see Section D-1. 2(a))
Naming Convention	None
Quantity	One (1)
Date of First Submittal	Delivered with Production Process (see Section F-1.6(a))
Submittal Frequency	Once
Government Approval Required	No
Required Metadata	None

1.4 ORIGINAL AERIAL FILM (FILM-BASED ACQUISITION ONLY)

Item	Requirement
Format	None
Media	Photographic film (see Attachment A)
Quantity	One (1) set
Date of First Submittal	No later than 45 calendar days after acquisition period
Submittal Frequency	Once
Government Approval Required	Yes (see Section E)
Required Metadata	None

1.5 PROGRESS REPORTS

Item	Requirement
Format	See Exhibit 3
Media	Electronic mail
Quantity	One per day per crew
Date of First Submittal	Daily (as required in accordance with Section C- 7.1)
Submittal Frequency	Daily (only required for days that aerial acquisition was accomplished)
Government Approval Required	No
Required Metadata	None

1.6 PROJECT DATA FILES

(a) PRODUCTION PROCESS DESCRIPTION

Item	Requirement
Format	ASCII text file
Media	CD-ROM (see Section D-1.2(a))
Naming Convention	See Section J, Exhibit 1
Quantity	One (1) for DOQQ and one (1) for CCM per project item area
Date of First Submittal	No later than 45 calendar days after acquisition period
Submittal Frequency	Once
Government Approval Required	No
Required Metadata	None

(b) PROJECT DATA FILE DESCRIPTION

Item	Requirement
Format	ASCII comma delimited text file
Media	CD-ROM (see Section D-1.2(a))
Naming Convention	See Section J, Exhibit 1
Quantity	One (1) per project item area
Date of First Submittal	Delivered with Production Process (see Section F-1.6(a))
Submittal Frequency	Once
Government Approval Required	No
Required Metadata	None

(c) PHOTO-CENTER DATA FILE DESCRIPTION

Item	Requirement
Format	ASCII comma delimited text file
Media	CD-ROM (see Section D-1. 2(a))
Naming Convention	See Section J, Exhibit 1
Quantity	One (1) per project item area
Date of First Submittal	Delivered with Production Process (see Section F-1.6(a))
Submittal Frequency	Once
Government Approval Required	No
Required Metadata	None

(d) SCAN DATA FILE DESCRIPTION (FILM-BASED ACQUISITION ONLY)

Item	Requirement
Format	ASCII comma delimited text file
Media	CD-ROM (see Section D-1. 2(a))
Naming Convention	See Section J, Exhibit 1
Quantity	One (1) per project item area
Date of First Submittal	Delivered with Production Process (see Section F-1.6(a))
Submittal Frequency	Once
Government Approval Required	No
Required Metadata	None

F-2 PLACE OF DELIVERY - FOB DESTINATION, WITHIN CONSIGNEE'S PREMISES

The materials to be furnished hereunder shall be delivered, all transportation charges paid by the Contractor, and in accordance with FAR Clause 52.247-35, F.o.b. Destination, Within Consignee's Premises, to:

USDA Aerial Photography Field Office
Attn: Contracting Officer
2222 West 2300 South
Salt Lake City, Utah 84119-2020

Offers submitted on a basis other than F.o.b. Destination within consignee's premises will be deemed unacceptable or rejected as non-responsive.

F-3 SCHEDULE FOR DELIVERY OF MATERIALS

All delivery materials required in this contract shall be shipped within the time limits specified below. Failure to ship within this period will be considered as failure by the Contractor to prosecute the work as to ensure completion and will render the contract subject to default. Date of shipment will be shown by postmark or carrier receipt.

3.1 Original Materials - Delivery Schedule

The compressed county files shall be shipped as soon as completed, no later than 30 calendar days after the acquisition period end date for each project area/state, prior to shipment of all remaining contract materials, to provide timely data to the user. The compressed county file must be received by the users as soon as available due to USDA program time constraints.

The required delivery schedule for all remaining contract materials required for a project item shall be shipped no later than 45 calendar days after the acquisition period has ended, or any season extension thereof.

It is recommended that materials be shipped when completed, since prompt delivery of materials will better assure timely inspection and avoidance of peak seasonal workload delivery.

3.2 Remake Materials - Delivery Schedule

Remake materials shall be shipped as soon as possible after correction is made, but no later than 30 days after receipt in the Contractor's facility of the materials or data required to make the corrections. Only materials as specifically requested by USDA to be remade shall be submitted for inspection. Signed delivery receipts will be required to verify date of receipt of such data or materials by the Contractor.

F-4 CONTRACTOR'S RESPONSIBILITIES

The Contractor shall: furnish all materials, superintendence, labor, transportation, and equipment; execute and complete the imagery acquisition of the area(s) specified and deliver to the USDA the materials called for; execute all work expeditiously, to the satisfaction of the Contracting Officer or authorized Contracting Officer's Representative(s).

F-5 PERFORMANCE OF THE WORK

The Contracting Officer will authorize and direct the acquisition period to begin or end anytime within thirty (30) days before or after the approximate acquisition dates given in the individual task orders, depending upon the weather, ground, foliage, and sun angle conditions required for the project item or area. No imagery shall be undertaken before the Notice to Proceed is issued or after the final date of the acquisition period (or its extension) has occurred. Weather and ground conditions for all project locations will be monitored daily to determine Contractor compliance to performance requirements.

5.1 Notice To Proceed

The Notice to Proceed will be given by telephone and confirmed in writing by regular mail. Failure of the Contractor to proceed with flights on a project item area within 10 calendar days after a "Notice to Proceed" is given, may be considered as evidence of failure to prosecute the work so as to ensure its timely completion. As evidence of performance, Progress Reports shall be submitted.

5.2 Progress Reports

Progress Reports indicating the progress made in acquiring project aerial photography shall be prepared in accordance with instructions in Section J, Exhibit 3, Progress Reports. Reports shall be submitted only for days performance was accomplished.

Each progress report shall be sent by email transmission not later than the day following performance. In the event that day is a holiday or non-business day, the report shall be sent on the next business day. Separate reports are required from each photographic crew assigned to a project item. Such "next day" reporting shall start when the Contractor receives the Notice to Proceed, and continue until the item is completed or the photographic season and any extension ends.

If it is determined that a season extension or additional flying is required, or reflights are ordered by USDA, reports covering such performance periods shall be submitted.

5.3 Acquisition Period Extension

The Government reserves the right to extend the acquisition period of this contract beyond the approximate period indicated in the individual task orders. A lower minimum sun angle requirement may be necessary to allow the season extension.

If an acquisition period extension is granted, a “preliminary” compressed county mosaic (CCM) shall be delivered within the schedule specified in paragraph 3.1 above that incorporates all imagery acquired through the end of the original flying season. A final CCM submittal shall be delivered no later than 30 days after the end of the season extension for all imagery acquired in the project area item, including imagery from the original flying season.

The Government may extend the season of this contract, at no increase in price, by written notice to the Contractor at any time prior to the end of the acquisition period. (Refer to FAR 52.217-08 "Option to Extend Services".)

5.4 Option to Extend the Term of the Contract (MAR 2000) (FAR 52.217-09)

(a) The Government may extend the term of this contract by written notice to the Contractor within **90** days of the end of the base and any option period; provided that the Government give the Contractor a preliminary written notice of its intent to extend at least **30** days before the contract expires. The preliminary notice does not commit the Government to an extension.

(b) If the Government exercises this option, the extended contract shall be considered to include this option clause.

(c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed 4 years 10 months.

F-6 CLAUSES INCORPORATED BY REFERENCE (FEB 1998) (FAR 52.252-2)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this address: www.arnet.gov/far.

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES:

52.211-11 Liquidated Damages-Supplies, Services, or Research and Development (SEP 2000)

52.242-15 Stop Work Order (AUG 1989)

52.242-17 Government Delay of Work (APR 1984)

PART I - THE SCHEDULE

SECTION G - CONTRACT ADMINISTRATION DATA

G-1 CONTRACTING OFFICE

The Aerial Photography Field Office (APFO) of the United States Department of Agriculture (USDA), Farm Service Agency (FSA), is responsible for the solicitation, award, and administration of this contract.

Communications shall be directed to:

Contracting Officer, USDA - FSA
Aerial Photography Field Office
2222 West 2300 South
Salt Lake City, Utah 84119-2020
Telephone (801) 975-3500 Ext. 207
Facsimile (801) 975-3529

Written correspondence shall reference the contract number and/or solicitation number plus project item number.

G-2 CONTRACTING OFFICER'S REPRESENTATIVE

Each awarded contract item may have a Contracting Officer's Representative (COR) or a Contracting Officer's Technical Representative (COTR). Such designations will be made either at the time of award or by appointment letter.

G-3 CONTRACT INTERPRETATION

Technical assistance regarding interpretation of the specifications and/or terms of the contract will be provided by the Contracting Officer or the COR. Only the Contracting Officer has authority to award, modify, and terminate contracts. The Contractor is encouraged to visit the USDA-APFO facilities and discuss the contract and inspection procedures.

3.1 Discrepancies

Any discrepancy in the schedule or official flight data shall be immediately called to the attention of the Contracting Officer for decision. A discrepancy shall not be adjusted without approval of the Contracting Officer, except at the Contractor's own risk and expense.

G-4 SUBCONTRACTS

Before entering into a subcontract covering any part of the work called for, the Contractor shall inform the Contracting Officer and submit information required to determine acceptability and approval of the proposed subcontractor.

G-5 CHARGES TO CONTRACTOR

The USDA may, at its option, correct deficiencies found to exist in connection with materials submitted by the Contractor and deduct from the Contractor's vouchers the cost thereof to the Government. When the deficiencies to be corrected are such that the cost exceeds $500.00 at current prices, such corrections will be made only with the prior approval of the Contractor, except in the event of termination for default.

G-6 INVOICES

One original invoice shall be submitted to the Contracting Officer designated in this contract. To constitute a proper invoice, the invoice must include the following information and/or attached documentation:

(a) Name and address of the Contractor
(b) Invoice date.
(c) Contract number, or other authorization for supplies delivered or services performed.
(d) Description, quantity, unit of measure, unit price, and extended price of supplies delivered or services performed.
(e) Shipping and payment terms.
(f) Name (where practicable), title, phone number, and complete mailing address of responsible official to whom payment is to be sent.
(g) Any other information or documentation required by the contract.
(h) While not required, contractors are strongly encouraged to assign an identification number to each invoice.

Notice of an apparent error, defect, or impropriety in an invoice will be given to the Contractor within 7 days of receipt of an invoice and suitable documented.

G-7 PERFORMANCE-BASED PAYMENTS

The Contractor shall adhere to the following performance-based payment description and schedule. Reference Section I-7 Performance-Based Payments (FAR 52.232-32).

7.1 Performance-Based Payments

(a) Proper invoices, see Section G-6, for authorized performance-based payments shall be submitted by a Project Item Area basis.

(b) Upon the completion of either the imagery acquisitions or at the end of an established acquisition period (or any granted extension to the period), the Contractor may submit an invoice for a maximum of sixty percent (60%) of the total number of DOQQs acquired multiplied by the awarded unit price.

(c) Upon final delivery of all required products for each Project Item Area, the Contractor may submit an invoice for a maximum of thirty percent (30%) of the total number of DOQQs acquired multiplied by the awarded unit price. The final delivery invoice will be based upon the delivery of all required products for the Project Item Area. Invoices based on acquisition period areas will not be considered.

(d) No other performance-based payments shall be issued without the Contracting Officer's approval.

7.2 Performance Criterion

The Contractor's request for performance-based payment shall contain the following information and documentation for basis for payment, in addition to information and certification required in FAR Clause 52.232-32, Performance-Based Payments:

(a) Documentation such as orders, invoices, or receipts, indicating the purchase of aerial film to be used on this project.

(b) Documentation such as orders, invoices, or receipts, indicating the processing and developing of the aerial film to be used on this project.

7.3 Final Acceptance

Upon final acceptance by the Government of a Project Line Item, a proper invoice may be submitted to the Contracting officer.

G-8 SMALL BUSINESS SUBCONTRACTING PLAN

Pursuant to FAR Clause 52.219-09, Small Business Subcontracting Plan (see I-9 Clauses Incorporated by Reference), large business concerns proposing contract awards exceeding $500,000 shall submit a subcontracting plan that separately addresses subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business concerns, small disadvantaged business and women owned small business concerns. A large business concern is defined as a business with average annual revenues over of $6 million under the NAICS Code 541922 for aerial photography services. Small business concerns are not required to submit small business subcontracting plans. The subcontracting plan shall be included and made a part of any resultant task order award and be negotiated with the Contracting Officer during the task order negotiation period. Failure to submit and negotiate the subcontracting plan shall make the offeror ineligible for award. Subcontracting plan data shall subsequently be entered into the Small Business Administration’s new Electronic Subcontracting Reporting System (eSRS) upon award.

PART I - THE SCHEDULE

SECTION H - SPECIAL CONTRACT REQUIREMENTS

H-1 PERMITS AND CLEARANCES

It shall be the responsibility of the Contractor to determine and secure all necessary permits and clearances for controlled or restricted airspace areas.

The Contractor shall contact the Federal Aviation Administration (FAA) watch supervisor in charge of the Air Traffic Control (ATC) facility to gain approval to operate within controlled airspace. It is suggested that pre-flight coordination be completed at least one week in advance. The FAA suggests that on the day of the flight the photo mission pilot contact the ATC facility and:

(a) Confirm previous arrangements,

(b) State that "this is a photo survey mission" via air/ground communications, and subsequently inform the controller when the flight line is commenced.

Military Operation Areas (MOA) will be identified in advance, and if necessary a contact for airspace clearance established. The Contractor is responsible for obtaining flight approvals and security clearances if required by the U.S. Department of Defense. Photographic and digital materials of classified areas shall be stored, handled, and shipped in accordance with existing security regulations. In the event of difficulty, the Contracting Officer shall be contacted for guidance and/or assistance.

The Contractor, and any flying subcontractors, shall contact the Contractor Officer for instructions prior to requesting clearance in the vicinity of “VIP” type airspace with Temporary Flight Restrictions (TFR). The notification to the Contracting Officer should include information such as aircraft tail number, requested clearance (i.e, time and flying location), and contact information.

H-2 AIRCRAFT REGULATIONS AND CERTIFICATIONS

All aircraft used in the performance of the work under this contract shall be maintained and operated in accordance with all regulations required by the U.S. Department of Transportation, Federal Aviation Administration (FAA). Aircraft operated in the acquisition of aerial photography or digital imagery under this contract shall be FAA certified to the highest flying altitude required to obtain proposed imagery.

H-3 OWNERSHIP OF CONTRACT MATERIALS

The Government shall receive copyright and ownership to all data delivered under this contract, including but not limited to photographic materials, orthorectified imagery, databases, and paper products, upon formal acceptance. The Contractor may maintain copyright and ownership of all original or derived works which are not required submittals under this contract. The Contractor is encouraged to create, market, and sell derived works not related to or in direct competition with the data delivered under this contract. For example, if this contract requires 2-meter orthorectified imagery be delivered to the Government, the Contractor may create 1-meter imagery from the original product, prior to its submittal to the Government, and resell it to other Government agencies or the general public. However, the Government also maintains the rights to derive additional products from the data delivered under this contract. No public distribution of the original or derived works shall be made prior to acceptance by the Government unless specified in the contract or authorized by the Contracting Officer.

H-4 NOTICE TO THE GOVERNMENT OF DELAY

The Contractor shall immediately, upon becoming aware of any difficulties in meeting performance requirements during the photographic season or when difficulties are encountered which may delay deliveries under the contract, notify the Contracting Officer in writing thereof. Such notification shall identify difficulties, the reasons therefore, and the estimated period of anticipated delay.

FAILURE OF THE CONTRACTOR TO GIVE SUCH NOTICE MAY PRECLUDE LATER CONSIDERATION OF ANY CLAIM FOR NON-PERFORMANCE DUE TO WEATHER CONDITIONS OR ANY REQUEST FOR AN EXTENSION OF CONTRACT TIME.

H-5 WAGE DETERMINATION

The Wage Determination applicable to any contract resulting from this solicitation is determined by the location of the Contractor's establishment.

Wage Determination number 1995-0222, Revision 20, dated May 24, 2006 will be applicable for Contractors located nationwide. See Section J, Exhibit 7, Wage Determination.

H-6 INDUSTRY SMALL BUSINESS STANDARD

The small business industry size standard for the type of services covered by this procurement, under NAICS code 541922, is the average annual receipts of the concern and its affiliates for the preceding three (3) years not in excess of $6 million.

PART II - CONTRACT CLAUSES

SECTION I - CONTRACT CLAUSES

I-1 STATEMENT OF EQUIVALENT RATES FOR FEDERAL HIRES (MAY 1989) (FAR 52.222-42)

In compliance with the Service Contract Act of 1965, as amended, and the regulations of the Secretary of Labor (29 CFR part 4), this clause identifies the classes of service employees expected to be employed under the contract and states the wages and fringe benefits payable to each if they were employed by the contracting agency subject to the provisions of 5 U.S.C. 5341 or 5332.

THIS STATEMENT IS FOR INFORMATION ONLY.
IT IS NOT A WAGE DETERMINATION.

Employee Class	Monetary Wage - Fringe Benefits
Aircraft Pilot	$40,000
Aerial Photographer	$22,000
Photo Lab Technician	$22,000

I-2 ORDERING (OCT 1995) (FAR 52.216-18)

(a) Any supplies and services to be furnished under this contract shall be ordered by issuance of delivery orders or task orders by the individuals or activities designated in the Schedule. Such orders may be issued from **January through September** for the base and option periods.

(b) All delivery orders or task orders are subject to the terms and conditions of this contract. In the event of conflict between a delivery order or task order and this contract, the contract shall control.

(c) If mailed, a delivery order or task order is considered "issued" when the Government deposits the order in the mail. Orders may be issued orally, by facsimile, or by electronic commerce methods only if authorized in the Schedule.

I-3 EVALUATION QUANTITIES--INDEFINITE DELIVERY CONTRACT (FEB 1998) (AGAR 452.216-72)

To evaluate offers for award purposes, the Government will apply the offeror's proposed fixed-prices/rates to the estimated quantities included in the solicitation, and will add other direct costs if applicable.

I-4 MINIMUM AND MAXIMUM CONTRACT AMOUNTS (FEB 1988)
(AGAR 452.216-73)

During the period specified in FAR clause 52.216-18, ORDERING, the Government shall place orders totaling a minimum of $2,500.00 but not in excess of $10.0 million.

I-5 ORDER LIMITATIONS (OCT 1995) (FAR 52.216-19)

(a) Minimum order. When the Government requires supplies or services covered by this contract in an amount of less than $2,500.00, the Government is not obligated to purchase, nor is the Contractor obligated to furnish, those supplies or services under the contract.

(b) Maximum order. The Contractor is not obligated to honor -

(1) Any order for a single item in excess of $10.0 million;
(2) Any order for a combination of items in excess of $10.0 million; or
(3) A series of orders from the same ordering office within 30 days that together call for quantities exceeding the limitation in paragraph (b)(1) or (2) of this section.

(c) If this is a requirements contract (i.e., includes the Requirements clause at subsection 52.216-21 of the Federal Acquisition Regulation (FAR), the Government is not required to order a part of any one requirement from the Contractor if that requirement exceeds the maximum-order limitations in paragraph (b) of this section.

(d) Notwithstanding paragraphs (b) and (c) of this section, the Contractor shall honor any order exceeding the maximum order limitations in paragraph (b), unless that order (or orders) is returned to the ordering office within 15 days after issuance, with written notice stating the Contractor's intent not to ship the item (or items) called for and the reasons. Upon receiving this notice, the Government may acquire the supplies or services from another source.

I-6 INDEFINITE QUANTITY (OCT 1995) (FAR 52.216-22)

(a) This is an indefinite-quantity contract for the supplies or services specified, and effective for the period stated, in the Schedule. The quantities of supplies and services specified in the Schedule are estimates only and are not purchased by this contract.

(b) Delivery or performance shall be made only as authorized by orders issued in accordance with the Ordering clause. The Contractor shall furnish to the Government, when and if ordered, the supplies or services specified in the Schedule up to and including the quantity designated in the Schedule as the "maximum." The Government

shall order at least the quantity of supplies or services designated in the Schedule as the "minimum."

(c) Except for any limitations on quantities in the Order Limitations clause or in the Schedule, there is no limit on the number of orders that may be issued. The Government may issue orders requiring delivery to multiple destinations or performance at multiple locations.

(d) Any order issued during the effective period of the contract and not completed within the period shall be completed by the Contractor within the time specified in the order. The contract shall govern the Contractor's and Government's rights and obligations with respect to that order to the same extent as if the order were completed during the contract's effective period; provided, that the Contractor shall not be required to make any deliveries under this contract after December 31, 2006.

I-7 PERFORMANCE-BASED PAYMENTS (FEB 2002) (FAR 52.232-32)

(a) Amount of payments and limitation on payments. Subject to such other limitations and conditions as are specified in this contract and this clause, the amount of payments and limitations on payments shall be specified in the contract's description of the basis for payment.

(b) Contractor request for performance-based payments. The Contractor may submit requests for payment of performance-based payments not more frequently than monthly, in a form and manner acceptable to the Contracting Officer. Unless otherwise authorized by the Contracting Officer, all performance-based payments in any period for which payment is being requested shall be included in a single request, appropriately itemized and totaled. The Contractor's request shall contain the information and certification detailed in paragraph (1) and (m) of this clause.

(c) Approval and payment of requests.

(1) The Contractor shall not be entitled to payment of a request for performance-based payment prior to successful accomplishment of the event or performance criterion for which payment is requested has been successfully accomplished in accordance with the terms of the contract. The Contracting Officer may, at any time, require the Contractor to substantiate the successful performance of any event or performance criterion which has been or is represented as being payable.

(2) A payment under this performance-based payment clause is a contract financing payment under the Prompt Payment clause of this contract and not subject to the interest penalty provision of the Prompt Payment Act. The designated payment office will pay approved requests on the 30th day after receipt of the request for performance-based payment. However, the designated payment office is not required to provide payment if the contracting Officer requires substantiation as

provided in paragraph (c)(1) of this clause, or inquires into the status of an event or performance criterion or into any of the conditions listed in paragraph (e) of this clause, or into the Contractor certification. The payment period will not begin until the Contracting Officer approves the request.

(3) The approval by the Contracting Officer of a request for performance-based payment does not constitute an acceptance by the Government and does not excuse the Contractor from performance of obligations under this contract.

(d) Liquidation of performance-based payment.

(1) Performance-based finance amounts paid prior to payment for delivery of an item shall be liquidated by deducting a percentage or a designated dollar amount from the delivery payment. If the performance-based finance payments are on a delivery item basis, the liquidation amount for each such line item shall be the percent of that delivery item price that was previously paid under performance-based finance payments are on a whole contract basis, liquidation shall be by either predesignated dollar amount. If the performance-based finance payments are on a whole contract basis, liquidation shall be by either predesignated liquidation amounts or a liquidation percentage.

(2) If at any time the amount of payments under this contract exceeds any limitation in this contract, the Contractor shall repay to the Government the excess. Unless otherwise determined by the Contracting Officer, such excess shall be credited as a reduction on the unliquidated performance-based payment balance(s), after adjustment of invoice payments and balances for any retroactive price adjustments.

(e) Reduction or suspension of performance-based payments. The Contracting Officer may reduce or suspend performance-based payments, liquidate performance-based payments by deduction from any payment under the contract, or take a combination of these actions after finding upon substantial evidence any of the following conditions:

(1) The Contractor failed to comply with any material requirement of this contract (which includes paragraphs (h) and (i) of this clause).

(2) Performance of this contract is endangered by the Contractor's:

(i) Failure to make progress; or
(ii) Unsatisfactory financial condition.

(3) The Contractor is delinquent in payment of any subcontractor or supplier under this contract in the ordinary course of business.

(f) Title.

(1) Title to the property described in this paragraph (f) shall vest in the Government. Vestiture shall be immediately upon the date of the first performance-based payment under this contract, for property acquired or produced before that date. Otherwise, vestiture shall occur when the property is or should have been allocable or properly chargeable to this contract.

(2) "Property," as used in this clause, includes all of the following described items acquired or produced by the Contractor that are or should be allocable or properly chargeable to this contract under sound and generally accepted accounting principles and practices:

(i) Parts, materials, inventories, and work in process;
(ii) Special tooling and special test equipment to which the Government is to acquire title under any other clause of this contract;
(iii) Nondurable (i.e., noncapital) tolls, jigs, dies, fixtures, molds, patterns, taps, gauges, test equipment and other similar manufacturing aids, title to which would not be obtained as special tooling under paragraph (f)(2)(ii) of this clause: and
(iv) Drawings and technical data, to the extent the Contractor or subcontractors are required to deliver them to the Government by other clauses of this contract.

(3) Although title to property is in the Government under this clause, other applicable clauses of this contract (e.g., the termination or special tooling clauses) shall determine the handling and disposition of the property.

(4) The Contractor may sell any scrap resulting from production under this contract, without requesting the Contracting Officer's approval, provided that any significant reduction in the value of the property to which the Government has title under this clause is reported in writing to the Contracting Officer.

(5) In order to acquire for its own use or dispose of property to which title is vested in the Government under this clause, the Contractor must obtain the Contracting Officer's advance approval of the action and the terms. If approved the basis for payment (the events or performance criteria) to which the property is related shall be deemed to be not in compliance with the terms of the contract and not payable (if the property is part of or needed for performance), and the Contractor shall refund the related performance-based payments in accordance with paragraph (d) of this clause.

(6) When the Contractor completes all of the obligations under this contract, including liquidation of all performance-based payments, title shall vest in the Contractor for all property (or the proceeds thereof) not -

(i) Delivered to, and accepted by, the Government under this contract; or

(ii) Incorporated in supplies delivered to, and accepted by, the Government under this contract and to which title is vested in the Government under this clause.

(7) The terms of this contract concerning liability for Government-furnished property shall not apply to property to which the Government acquired title solely under this clause.

(g) Risk of Loss. Before delivery of and acceptance by the Government, the Contractor shall bear the risk of loss for property, the title to which vests in the Government under this clause, except to the extent the Government expressly assumes the risk. If any property is damaged, lost, stolen, or destroyed, the basis of payment (the events or performance criteria) to which the property is related shall be deemed to be not in compliance with the terms of the contract and not payable (if the property is part of or needed for performance), and the Contractor shall refund the related performance-based payments in accordance with paragraph (d) of this clause.

(h) Records and controls. The Contractor shall maintain records and controls adequate for administration of this clause. The Contractor shall have no entitlement to performance-based payments during any time the Contractor's records or controls are determined by the Contracting Officer to be inadequate for administration of this clause.

(i) Reports and Government access. The Contractor shall promptly furnish reports, certificates, financial statements, and other pertinent information requested by the Contracting Officer for the administration of this clause and to determine that an event or other criterion prompting a financing payment has been successfully accomplished. The Contractor shall give the Government reasonable opportunity to examine and verify the Contractor's records and to examine and verify the Contractor's performance of this contract for administration of this clause.

(j) Special terms regarding default. If this contract is terminated under the Default clause,

(1) The Contractor shall, on demand, repay to the Government the amount of unliquidated performance-based payments, and

(2) Title shall vest in the Contractor, on full liquidation of all performance-based payments, for all property for which the Government elects not to require delivery under the Default clause of this contract. The Government shall be liable for no payment except as provided by the Default clause.

(k) Reservation of rights.

(1) No payment or vesting of title under this clause shall -

(i) Excuse the Contractor from performance of obligations under this contract; or

(ii) Constitute a waiver of any of the rights or remedies of the parties under the contract.

(2) The Government's rights and remedies under this clause -

(i) Shall not be exclusive, but rather shall be in addition to any other rights and remedies proved by law or this contract; and
(ii) Shall not be affected by delayed, partial, or omitted exercise of any right, remedy, power, or privilege, nor shall such exercise under this clause or the exercise of any right, power, or privilege of the Government.

(l) Content of Contractor's request for performance-based payment. The Contractor's request for performance-based payment shall contain the following:

(1) The name and address of the Contractor;

(2) The date of the request for performance-based payment;

(3) The contract number and/or other identifier of the contract or order under which the request is made;

(4) Such information and documentation as is required by the contract's description of the basis for payment; and

(5) A certification by a Contractor official authorized to bind the Contractor, as specified in paragraph (m) of this clause.

(m) Content of Contractor's Certification. As required in paragraph (l)(5) of this clause, the Contractor shall make the following certification in each request for performance-based payment:

I certify to the best of my knowledge and belief that -

(1) This request for performance-based payment is true and correct; this request (and attachments) has been prepared from the books and records of the Contractor, in accordance with the contract and the instructions of the Contracting Officer;

(2) (Except as reported in writing on _____, all payments to subcontractors and suppliers under this contract have been paid, or will be paid, currently, when due in the ordinary course of business;

(3) There are no encumbrances (except as reported in writing on _____ against the property acquired or produced for, and allocated or properly chargeable to, the contract which would affect or impair the Government's title;

(4) There has been no materially adverse change in the financial condition of the

Contractor since the submission by the Contractor to the Government of the most recent written information dated _____; and

(5) After the making of this requested performance-based payment, the amount of all payments for each deliverable item for which performance-based payments have been requested will not exceed any limitation in the contract, and the amount of all payments under the contract will not exceed any limitation in the contract.

I-8 WARRANTY OF SUPPLIES OF A NONCOMPLEX NATURE. (JUN 2003) (FAR 52.246-17)

As prescribed in 46.710(a)(1), insert a clause substantially as follows:

(a) Definitions. As used in this clause-

"Acceptance" means the act of an authorized representative of the Government by which the Government assumes for itself, or as an agent of another, ownership of existing supplies, or approves specific services as partial or complete performance of the contract.

"Supplies" means the end items furnished by the Contractor and related services required under this contract. The word does not include "data."

(b) Contractor's obligations.

(1) Notwithstanding inspection and acceptance by the Government of supplies furnished under this contract, or any condition of this contract concerning the conclusiveness thereof, the Contractor warrants that until December 31 of the following year after the end of the acquisition period:

(i) All supplies furnished under this contract will be free from defects in material or workmanship and will conform with all requirements of this contract; and
(ii) The preservation, packaging, packing, and marking, and the preparation for, and method of, shipment of such supplies will conform with the requirements of this contract.

(2) When return, correction, or replacement is required, transportation charges and responsibility for the supplies while in transit shall be borne by the Contractor. However, the Contractor's liability for the transportation charges shall not exceed an amount equal to the cost of transportation by the usual commercial method of shipment between the place of delivery specified in this contract and the Contractor's plant, and return.

(3) Any supplies or parts thereof, corrected or furnished in replacement under this clause, shall also be subject to the terms of this clause to the same extent as supplies

initially delivered. The warranty, with respect to supplies or parts thereof, shall be equal in duration to that in paragraph (b)(1) of this clause and shall run from the date of delivery of the corrected or replaced supplies.

(4) All implied warranties of merchantability and "fitness for a particular purpose" are excluded from any obligation contained in this contract.

(c) Remedies available to the Government.

(1) The Contracting Officer shall give written notice to the Contractor of any breach of warranties in paragraph (b)(1) of this clause within 30 days after discovery of the defect.

(2) Within a reasonable time after the notice, the Contracting Officer may either-

(i) Require, by written notice, the prompt correction or replacement of any supplies or parts thereof (including preservation, packaging, packing, and marking) that do not conform with the requirements of this contract within the meaning of paragraph (b)(1) of this clause; or
(ii) Retain such supplies and reduce the contract price by an amount equitable under the circumstances.

(3) (i) If the contract provides for inspection of supplies by sampling procedures, conformance of supplies or components subject to warranty action shall be determined by the applicable sampling procedures in the contract. The Contracting Officer-

(A) May, for sampling purposes, group any supplies delivered under this contract;
(B) Shall require the size of the sample to be that required by sampling procedures specified in the contract for the quantity of supplies on which warranty action is proposed;
(C) May project warranty sampling results over supplies in the same shipment or other supplies contained in other shipments even though all of such supplies are not present at the point of reinspection; provided, that the supplies remaining are reasonably representative of the quantity on which warranty action is proposed; and
(D) Need not use the same lot size as on original inspection or reconstitute the original inspection lots.

(ii) Within a reasonable time after notice of any breach of the warranties specified in paragraph (b)(1) of this clause, the Contracting Officer may exercise one or more of the following options:

(A) Require an equitable adjustment in the contract price for any group of supplies.
(B) Screen the supplies grouped for warranty action under this clause at the

Contractor's expense and return all nonconforming supplies to the Contractor for correction or replacement.

(C) Require the Contractor to screen the supplies at locations designated by the Government within the contiguous United States and to correct or replace all nonconforming supplies.

(D) Return the supplies grouped for warranty action under this clause to the Contractor (irrespective of the f.o.b. point or the point of acceptance) for screening and correction or replacement.

(4) (i) The Contracting Officer may, by contract or otherwise, correct or replace the nonconforming supplies with similar supplies from another source and charge to the Contractor the cost occasioned to the Government thereby if the Contractor-

(A) Fails to make redelivery of the corrected or replaced supplies within the time established for their return; or

(B) Fails either to accept return of the nonconforming supplies or fails to make progress after their return to correct or replace them so as to endanger performance of the delivery schedule, and in either of these circumstances does not cure such failure within a period of 10 days (or such longer period as the Contracting Officer may authorize in writing) after receipt of notice from the Contracting Officer specifying such failure.

(ii) Instead of correction or replacement by the Government, the Contracting Officer may require an equitable adjustment of the contract price. In addition, if the Contractor fails to furnish timely disposition instructions, the Contracting Officer may dispose of the nonconforming supplies for the Contractor's account in a reasonable manner. The Government is entitled to reimbursement from the Contractor, or from the proceeds of such disposal, for the reasonable expenses of the care and disposition of the nonconforming supplies, as well as for excess costs incurred or to be incurred.

(5) The rights and remedies of the Government provided in this clause are in addition to and do not limit any rights afforded to the Government by any other clause of this contract.

(End of clause)

I-9 CLAUSES INCORPORATED BY REFERENCE (FEB 1998) (FAR 52.252-2)

This contract incorporates the following clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this address: www.arnet.gov/far.

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES:

52.202-01 Definitions (JUL 2004)

52.203-03 Gratuities (APR 1984)

52.203-05 Covenant Against Contingent Fees (APR 1984)

52.203-06 Restrictions on Subcontractor Sales to the Government (SEP 2006)

52.203-07 Anti-Kickback Procedures (JUL 1995)

52.203-08 Cancellation, Rescission, and Recovery of Funds for Illegal or Improper Activity (JAN 1997)

52.203-10 Price or Fee Adjustment for Illegal or Improper Activity (JAN 1997)

52.203-12 Limitation on Payments to Influence Certain Federal Transactions (SEP 2005)

52.204-04 Printing/Copying Double-Sided on Recycled Paper (AUG 2000)

52.204-07 Central Contractor Registration (JUL 2006)

52.209-06 Protecting the Government's Interest When Subcontracting With Contractors Debarred, Suspended, or Proposed for Debarment (SEP 2006)

52.211-05 Material Requirements (AUG 2000)

52.215-02 Audit and Records - Negotiation (JUN 1999)

52.215-08 Order of Precedence - Uniform Contract Format (OCT 1997)

52.215-14 Integrity of Unit Prices (OCT 1997)

52.217-08 Option to Extend Services (NOV 1999)

52.217-09 Option to Extend the Term of the Contract (MAR 2000)

52.219-04 Notice of Price Evaluation Preference for HUBZone Small Business Concerns (JUL 2005)

52.219-08 Utilization of Small Business Concerns (MAY 2004)

52.219-09 Small Business Subcontracting Plan, Alternate II (SEP 2006)

52.219-16 Liquidated Damages – Subcontracting Plan (OCT 2001)

52.222-03 Convict Labor (JUN 2003)

52.222-04 Contract Work Hours and Safety Standards Act - Overtime Compensation (JUL 2005)

52.222-19 Child Labor – Cooperation with Authorities and Remedies (JAN 2006

52.222-21 Prohibition of Segregated Facilities (FEB 1999)

52.222-26 Equal Opportunity (APR 2002)

52.222-35 Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (SEP 2006)

52.222-36 Affirmative Action for Workers with Disabilities (JUN 1998)

52.222-37 Employment Reports on Special Disabled Veterans and Veterans of the Vietnam Era, and Other Eligible Veterans (SEP 2006)

52.222-41 Service Contract Act of 1965, as Amended (JUL 2005)

52.222-44 Fair Labor Standards Act and Service Contract Act - Price Adjustment (FEB 2002)

52.222-50 Combating Trafficking in Persons (APR 2006)

52.223-06 Drug-Free Workplace (MAY 2001)

52.223-14 Toxic Chemical Release Reporting (AUG 2003)

52.225-03 Buy American Act - North American Free Trade Agreement - Israeli Trade Act (NOV 2006)

52.225-13 Restrictions on Certain Foreign Purchases (FEB 2006)

52.227-01 Authorization and Consent (JUL 1995)

52.227-02 Notice and Assistance regarding Patent & Copyright Infringement (AUG 1996)

52.227-14 Rights in Data - General - Alternate I (JUN 1987)

52.229-03 Federal, State, and Local Taxes (APR 2003)

52.232-01 Payments (APR 1984)

52.232-08 Discounts for Prompt Payment (FEB 2002)

52.232-11 Extras (APR 1984)

52.232-17 Interest (JUN 1996)

52.232-18 Availability of Funds (APR 1984)

52.232-19 Availability of Funds for the Next Fiscal Year (APR 1984)

52.232-23 Assignment of Claims (JAN 1986)

52.232-25 Prompt Payment (OCT 2003)

52.232-33 Payment by Electronic Funds Transfer – Central Contractor Registration (OCT 2003)

52.233-01 Disputes (JUL 2002)

52.233-03 Protest After Award (AUG 1996)

52.233-04 Applicable Law for Breach of Contract Claim (OCT 2004)

52.242-02 Production Progress Reports (APR 1991)

52.242-13 Bankruptcy (JUL 1995)

52.243-01 Changes - Fixed Price - Alternate II (AUG 1987)

52.244-06 Subcontracts for Commercial Items (SEP 2006)

52.245-02 Government Property (Fixed Price Contracts) (MAY 2004)

52.245-09 Use and Charges (AUG 2005)

52.245-19 Government Property Furnished “As Is” (APR 1984)

52.246-25 Limitation of Liability - Services (FEB 1997)

52.248-01 Value Engineering (FEB 2000)

52.249-04 Termination for Convenience of the Government (Services) (Short Form) (APR 1984)

52.249-08 Default (Fixed-Price Supply and Service) (APR 1984)

52.253-01 Computer Generated Forms (JAN 1991)

PART III - LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS

SECTION J - LIST OF ATTACHMENTS

Exhibit	Description	Page
Exhibit 1	File Naming Convention	46
Exhibit 2	Labeling Requirements (5 pages)	47-51
Exhibit 3	Progress Report (2 pages)	52-53
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Exhibit 5	Flight Line Exposure Station Reference System (1 page)	55
Exhibit 6	NAPP Exposure Station Reference System (1 page)	56
Exhibit 7	Wage Determination (3 Pages)	57-59
Exhibit 8	Glossary and Definitions (1 page)	60

Attachment A: NAIP Specification for Film Based Acquisition, dated February 16, 2007 (16 pages)

Attachment B: NAIP Specification for Digital Sensor Based Acquisition, dated February 16, 2007 (5 pages)

Attachment C: DOQQ Description and Specification (15 pages)

EXHIBIT 1

FILE NAMING CONVENTION

Text Data Files:

File Name: <type>_<solno>_<item>_<st>.txt

type - file type (must be "abstract" "process" "project" "photo" or "scan")
solno - contract solicitation number
item - item number
st - state abbreviation

Example: process_3-04_1_mo.txt
project_3-04_1_mo.txt

Quarter Quadrangle Image Tiles:

File Name: <n>_<lat><lon><quad>_<loc>_<xx>_<r>_<yyyymmdd>.tif

n – film type/bandwidth designator ("o"=black & white; "n"=natural color;" "c"=color IR, or "m"=multispectral)
lat - latitude, identified by 2 digit numerical value of a 1º block
lon - longitude, identified by 3 digit numerical value of a 1º block (including the leading "0" if needed)
quad - quadrangle number, identified by grid number
loc - quadrangle location, identified by grid letters (nw, ne, sw, se)
xx – two digit UTM zone
r - resolution (1=1 meter; 2=2 meter)
yyyymmdd - date of acquisition (majority date)

Example: c_3509320_ne_15_1_20040721.tif

Compressed County Mosaics:

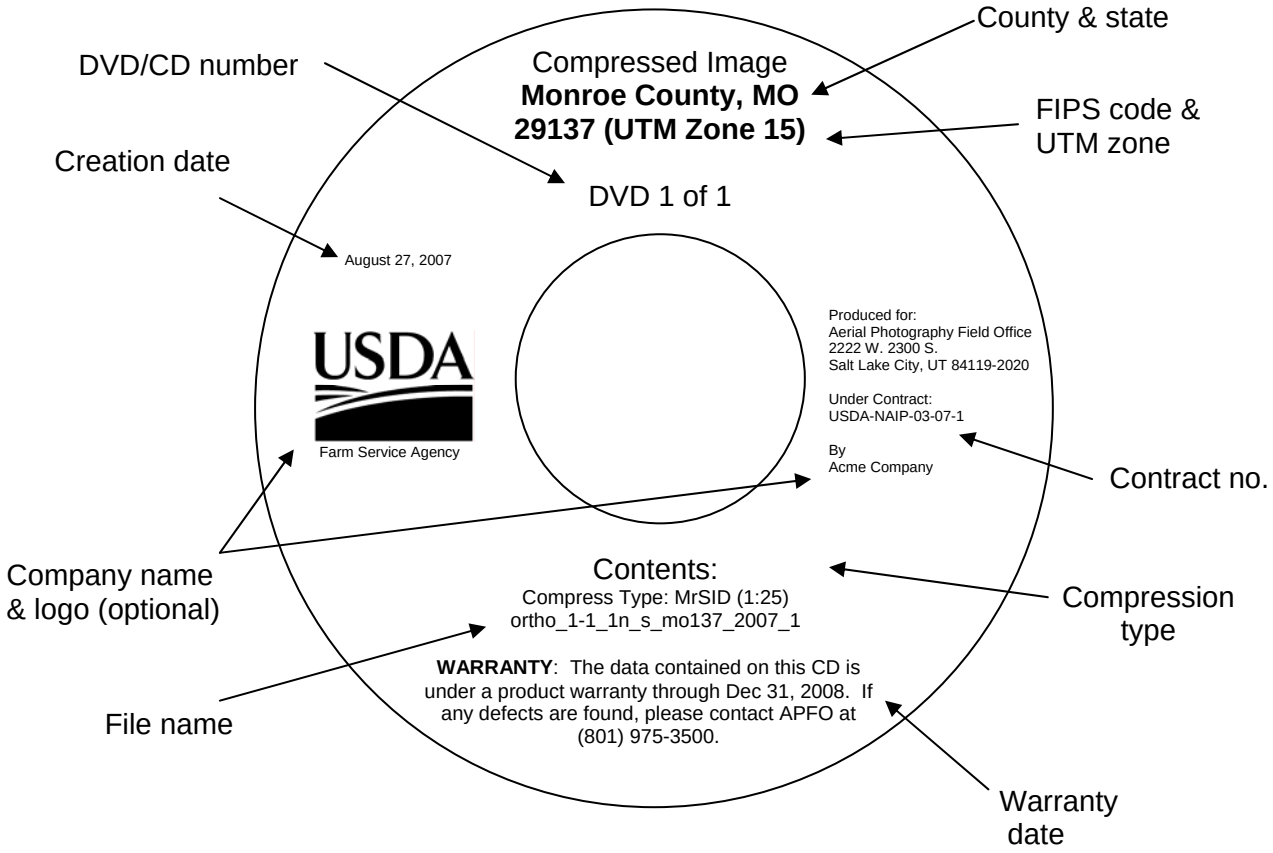
File Name: naip_<x-x>_<r><n>_<f>_<stnnn>_<yyyy>_<v>.sid

Prefix – Prefix ("ortho" = 1-meter or "naip" = 2-meter)
x-x - disk number and total count (i.e., "1-2" = disk 1 of 2)
r - resolution ("1" = 1- meter or "2" = 2-meter)
n – film type/bandwidth designator ("o" = black & white; "n" = natural color; "c" = color IR, or "m"=multispectral)
f - compression format (s=MrSID®)
stnnn – state and FIPS code
yyyy - year of aerial acquisition
v - version number

Example: ortho_1-1_1n_s_mo137_2007_1.sid
naip_1-1_2n_s_ca123_2007_1.sid

EXHIBIT 2
Figure 1

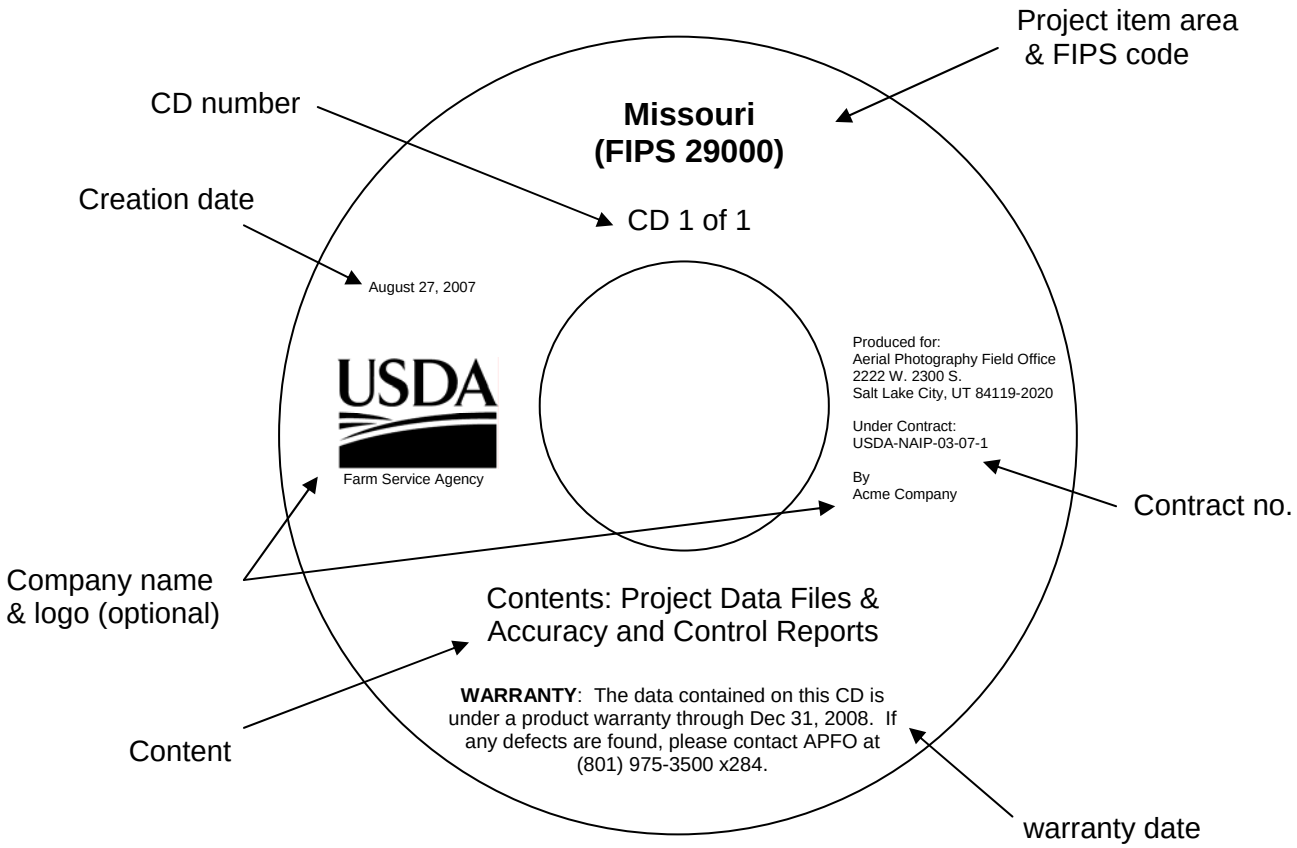
COMPRESSED COUNTY MOSAICS
CD-ROM Labeling Requirements



ELEMENT	EXAMPLE
CD Number	CD 1 of 1
Company name & logo	Acme Company
Compression type & ratio	MrSID® (1:25)
Contract number	USDA-NAIP-3-07-1
Country & state	Monroe County, MO
Creation date	August 27, 2007
File name	ortho_1-1_1n_s_mo137_2007_1
FIPS code & UTM zone	29137 (UTM Zone 15)
Warranty date	Dec 31, 2008

EXHIBIT 2
Figure 2

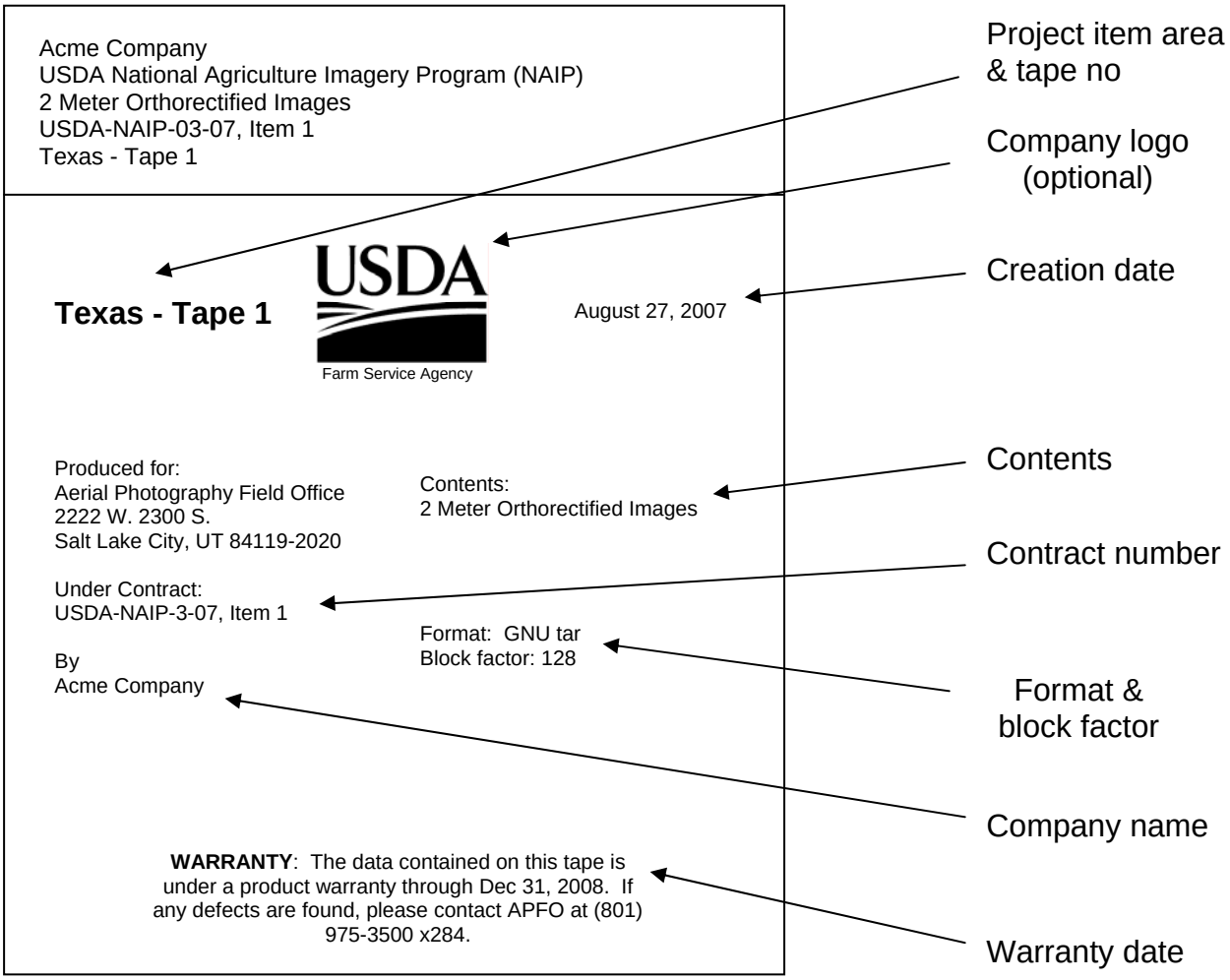
Project Data Files
CD-ROM Labeling Requirements



ELEMENT	EXAMPLE
CD Number	CD 1 of 1
Company name & logo	Acme Company
Content	Project Data Files & Accuracy and Control Reports
Contract number	USDA-NAIP-3-07-1
Creation date	August 27, 2007
Project item area & FIPS code	Missouri (FIPS 29000)
Warranty date	Dec 31, 2008

EXHIBIT 2
Figure 3

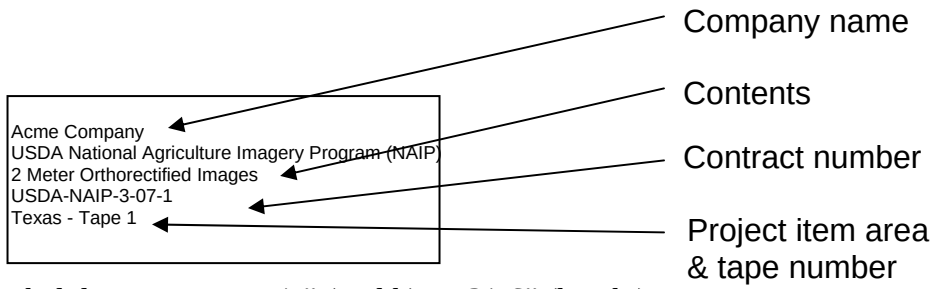
QUARTER QUADRANGLE IMAGE TILE
DLT Tape Cartridge Case Labeling Requirements



Label dimensions: 4-3/16” (width) x 5-1/8” (height)
Note: Fold line is 1” from the top of the label.

Figure 3 (con't)

QUARTER QUADRANGLE IMAGE TILE
DLT Tape Cartridge Labeling Requirements

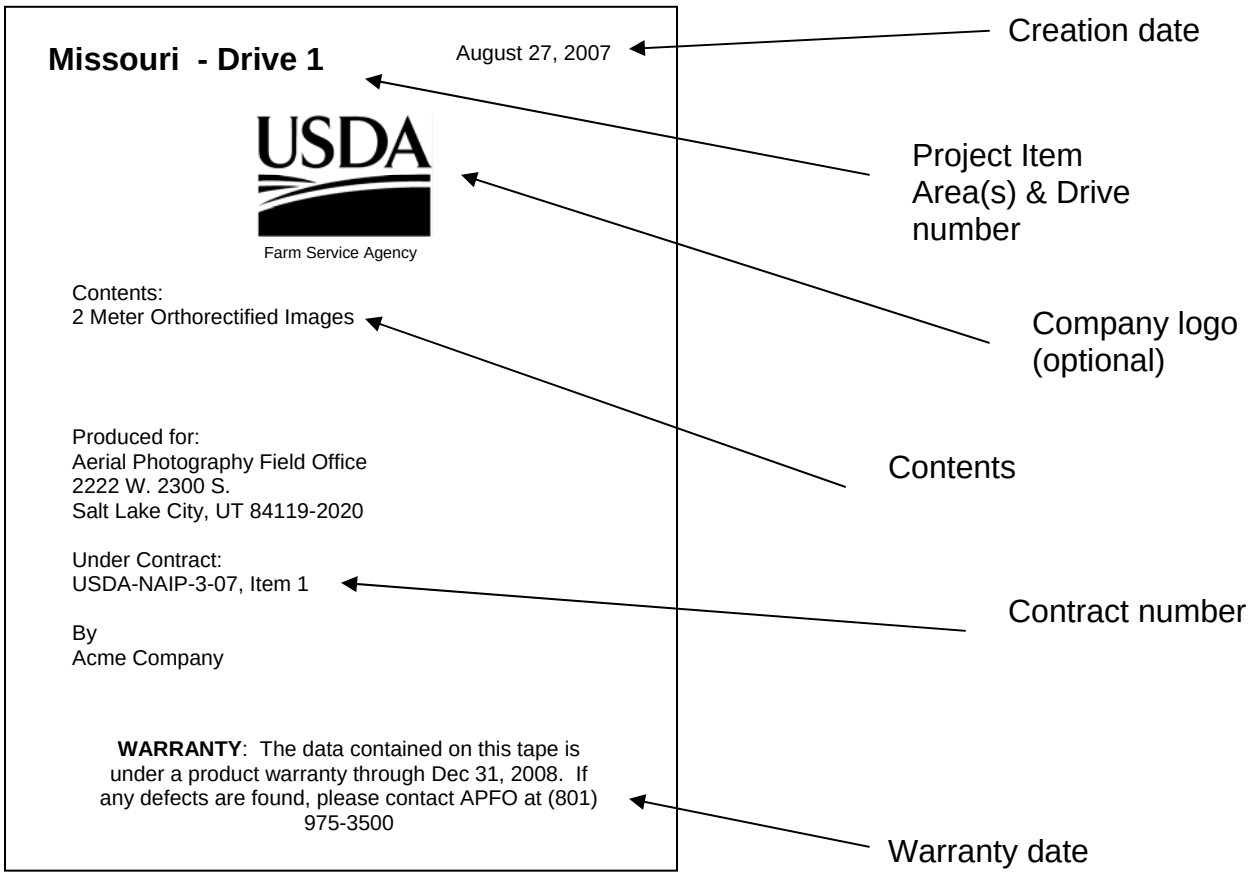


Label dimensions: 2-1/4" (width) x 13/16" (height)
NOTE: Cartridge label must fit securely in tape slot to prevent falling out.

ELEMENT	EXAMPLE
Company name & logo	Acme Company
Contents	2 Meter Orthorectified Images
Contract number	USDA-NAIP-3-07-1
Creation date	August 27, 2007
Format & block factor	Format: tar Block factor: 128
Project item area & tape number	Texas – Tape 1
Warranty date	Dec 31, 2008

EXHIBIT 2
Figure 4

External Hard Drive Labeling Requirements



ELEMENT	EXAMPLE
Company name & logo	Acme Company
Contents	2 Meter Orthorectified Images
Contract number	USDA-NAIP-3-07-1
Creation date	August 27, 2004
Project item area & drive number	Missouri – Tape 1
Warranty date	Dec 31, 2008

Approximate label dimensions: 3-1/2” (width) x 4-1/2” (height)

EXHIBIT 3

PROGRESS REPORT CONVENTION

The goal is to accurately report daily image acquisition and to indicate those areas that a contractor has determined the acquired imagery to the unusable which will result in a reflight for a particular area.

Syntax:

HEADER ITEMS:	field-name ":"[field-body][CRFL]
BODY ITEMS:	body item [CRFL]

Header Items:
All four header items are required to be submitted in each and every submittal.

DESCRIPTION	KEYWORD	FORMAT
Contractor Name	CONTRACTOR	Alphanumeric
Contract Award Number	CONTRACT	Numeric (N-YY)
Award Item	ITEM	Numeric (N)
Date Flown	DATE	Date (YYYYMMDD)

Body Items:
All data elements are required for each line of data submitted. Data elements are to be separated by 5 ASCII decimal 32 (white space). Acquisition and rejected exposure stations can be submitted as separate reports or as a combined report.

DESCRIPTION	KEYWORD	FORMAT
DOQQ Id	N/A	Char(9)
Latitude	N/A	DD.DDDDD
Longitude	N/A	-DDD.DDDDD
Status	N/A	Char(1)*
Aircraft tail number	N/A	Char(6)

* Status Field:
A - Indicates the Exposure Station has been collected
R – Indicates the contractor has rejected a previously acquired Exposure Station

When an exposure station is rejected the exposure station will appear in a later report marked with an "R". Each report submitted should include only one status indicator for a particular exposure station.

PROGRESS REPORT CONVENTION (CON'T)

Sample:

```
CONTRACTOR:  Acme Photography
CONTRACT:  3-07
ITEM:  1
DATE:  20070827

4210337nw    34.87500    86.28139    A    N12345
4210337sw    34.90639    86.28139    A    N12345
4210345nw    34.93750    86.28139    A    N12345
4210345sw  . 34.96889    86.28139    A    N12345
```

Notes:

1) Text is case insensitive.
2) Header fields are not required to occur in any particular order.
3) Body items must occur after the headers.
4) Each header item must be on a single line (no "folding")
5) Keywords may not contain spaces and must be followed immediately by a colon.
6) The header items and body items may be separated by a NULL line (a blank line with a carriage-return/line-feed (CRLF)(ASCII 13 and 10).
7) Body items can only contain one data item per line and must be terminated by a carriage-return/line-feed.
8) Task order award number must be sent without prefix (i.e., NAIP-TO-3-07-1 should be sent as 3-07).
9) Date must be transmitted as YYYYMMDD.
10) No e-mail attachments.

EXHIBIT 4

IMAGE SCAN NAMING LOGIC

121° 00' 00"
49° 00' 00" •

01	02	03	04	05	06	07	08
09	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64

• 48° 00' 00"
120° 00' 00"

NW	NE
SW	SE

The image ID for this scan would be:
4812043_ne

Each Block (ie: 43) is a full Quad within the 1 degree grid; it is further subdivided into 4 quarter-quads

Sample: **4812043_ne** Where:

Latitude: Identified by 2 digit numerical value of a 1 degree block.
Longitude: Identified by 3 digit numerical value of a 1 degree block, including a leading “0" as needed.
Quadrangle Number: Identified by grid number (01, 02, 03, ... 63, 64) See Exhibit 7.
Quarter Quadrangle Location: Identified by grid letters (nw, ne, sw, se)

EXHIBIT 5

FLIGHT LINE EXPOSURE STATION REFERENCE SYSTEM

95º 00’

	96º 00’	**95º 45’**	**95º 30’**	**95º 15’**	**95º 00’**				
	8W / 8E	**7W / 7E**	**6W / 6E**	**5W / 5E**	**4W / 4E**	**3W / 3E**	**2W / 2E**	**1W / 1E**	
40º 00’	**513**	**513**	**513**	**513**	**513**	**513**	**513**	**513**	**40º 00’**
	512	512	512	512	512	512	512	512	
	511	511	511	511	511	511	511	511	
	510	510	510	510	510	510	510	510	
	509	509	509	509	509	509	509	509	
	508	508	508	508	508	508	508	508	
	507	507	507	507	507	507	507	507	
	506	506	506	506	506	506	506	506	
39º 45’	**505**	**505**	**505**	**505**	**505**	**505**	**505**	**505**	**39º 45’**
	504	504	504	504	504	504	504	504	
	503	503	503	503	503	503	503	503	
	502	502	502	502	502	502	502	502	
	501	501	501	501	501	501	501	501	
	500	500	500	500	500	500	500	500	
	499	499	499	499	499	499	499	499	
	498	498	498	498	498	498	498	498	
39º 30’	**497**	**497**	**497**	**497**	**497**	**497**	**497**	**497**	**39º 30’**
	496	496	496	496	496	496	496	496	
	495	495	495	495	495	495	495	495	
	494	494	494	494	494	494	494	494	
	493	493	493	493	493	493	493	493	
	492	492	492	492	492	492	492	492	
	491	491	491	491	491	491	491	491	
	490	490	490	490	490	490	490	490	
39º 15’	**489**	**489**	**489**	**489**	**489**	**489**	**489**	**489**	**39º 15’**
	488	488	488	488	488	488	488	488	
	487	487	487	487	487	487	487	487	
	486	486	486	486	486	486	486	486	
	485	485	485	485	485	485	485	485	
	484	484	484	484	484	484	484	484	
	483	483	483	483	483	483	483	483	
	482	482	482	482	482	482	482	482	
39º 00’	**481**	**481**	**481**	**481**	**481**	**481**	**481**	**481**	**39º 00’**
	8W / 8E	**7W / 7E**	**6W / 6E**	**5W / 5E**	**4W / 4E**	**3W / 3E**	**2W / 2E**	**1W / 1E**	

FLIGHT LINE AND EXPOSURE EXAMPLE FOR NORTHEAST CORNER EXPOSURE: 0951E - 0513

Flight Line: **095** = Eastern Longitude coordinate of 1 degree x 1 degree area (padded by leading zeros).
1 = Number assigned to 7-1/2 minute column within 1 degree x 1 degree area.
E = East flight line within 7-1/2 minute column.

Exposure Station: **0513** = number assigned by latitude position to each predetermined photo center.

The Flight Line and Exposure Station Reference System was developed for identifying the geographic location of individual photos acquired for the National Aerial Photography Program.

EXHIBIT 6

NAPP EXPOSURE STATION REFERENCE SYSTEM

50° -- 833				
7 -- 829	7 -- 669	7 -- 509	7 -- 349	7 -- 189	7 -- 29
6 -- 825	6 -- 665	6 -- 505	6 -- 345	6 -- 185	6 -- 25
5 -- 821	5 -- 661	5 -- 501	5 -- 341	5 -- 181	5 -- 21
4 -- 817	4 -- 657	4 -- 497	4 -- 337	4 -- 177	4 -- 17
3 -- 813	3 -- 653	3 -- 493	3 -- 333	3 -- 173	3 -- 13
2 -- 809	2 -- 649	2 -- 489	2 -- 329	2 -- 169	2 -- 9
1 -- 805	1 -- 645	1 -- 485	1 -- 325	1 -- 165	1 -- 5
49° -- 801	44° -- 641	39° -- 481	34° -- 321	29° -- 161	24° -- 1
7 -- 797	7 -- 637	7 -- 477	7 -- 317	7 -- 157	
6 -- 793	6 -- 633	6 -- 473	6 -- 313	6 -- 153	
5 -- 789	5 -- 629	5 -- 469	5 -- 309	5 -- 149	
4 -- 785	4 -- 625	4 -- 465	4 -- 305	4 -- 145	
3 -- 781	3 -- 621	3 -- 461	3 -- 301	3 -- 141	
2 -- 777	2 -- 617	2 -- 457	2 -- 297	2 -- 137	
1 -- 773	1 -- 613	1 -- 453	1 -- 293	1 -- 133	
48° -- 769	43° -- 609	38° -- 449	33° -- 289	28° -- 129	
7 -- 765	7 -- 605	7 -- 445	7 -- 285	7 -- 125	
6 -- 761	6 -- 601	6 -- 441	6 -- 281	6 -- 121	
5 -- 757	5 -- 597	5 -- 437	5 -- 277	5 -- 117	
4 -- 753	4 -- 593	4 -- 433	4 -- 273	4 -- 113	
3 -- 749	3 -- 589	3 -- 429	3 -- 269	3 -- 109	
2 -- 745	2 -- 585	2 -- 425	2 -- 265	2 -- 105	
1 -- 741	1 -- 581	1 -- 421	1 -- 261	1 -- 101	
47° -- 737	42° -- 577	37° -- 417	32° -- 257	27° -- 97	
7 -- 733	7 -- 573	7 -- 413	7 -- 253	7 -- 93	
6 -- 729	6 -- 569	6 -- 409	6 -- 249	6 -- 89	
5 -- 725	5 -- 565	5 -- 405	5 -- 245	5 -- 85	
4 -- 721	4 -- 561	4 -- 401	4 -- 241	4 -- 81	
3 -- 717	3 -- 557	3 -- 397	3 -- 237	3 -- 77	
2 -- 713	2 -- 553	2 -- 393	2 -- 233	2 -- 73	
1 -- 709	1 -- 549	1 -- 389	1 -- 229	1 -- 69	
46° -- 705	41° -- 545	36° -- 385	31° -- 225	26° -- 65	
7 -- 701	7 -- 541	7 -- 381	7 -- 221	7 -- 61	
6 -- 697	6 -- 537	6 -- 377	6 -- 217	6 -- 57	
5 -- 693	5 -- 533	5 -- 373	5 -- 213	5 -- 53	
4 -- 689	4 -- 529	4 -- 369	4 -- 209	4 -- 49	
3 -- 685	3 -- 525	3 -- 365	3 -- 205	3 -- 45	
2 -- 681	2 -- 521	2 -- 361	2 -- 201	2 -- 41	
1 -- 677	1 -- 517	1 -- 357	1 -- 197	1 -- 37	
45° -- 673	40° -- 513	35° -- 353	30° -- 193	25° -- 33	

SAMPLE:

40°
7 --39° 52½'
6 --39° 45'
5 --39° 37½'
4 --39° 30'
3 --39° 22½'
2 --39° 15'
1 --39° 7½'
39°

EXHIBIT 7

Page 1

REGISTER OF WAGE DETERMINATIONS UNDER
THE SERVICE CONTRACT ACT
By direction of the Secretary of Labor

William W. Gross
Director

Division of
Wage Determinations

U.S. DEPARTMENT OF LABOR
EMPLOYMENT STANDARDS ADMINISTRATION
WAGE AND HOUR DIVISION
WASHINGTON, D.C. 20210

Wage Determination No.: 1995-0222
Revision No.: 20
Date of Last Revision: 05/24/2006

Nationwide: Applicable in the continental U.S. Alaska, Puerto Rico, Hawaii and Virgin Islands.

** Fringe Benefits Required Follow the Occupational Listing **

Employed on U.S. Government contracts for aerial photograher, aerial seeding, aerial spraying, transportation of personnel and cargo, fire reconnaissance, administrative flying, fire detection, air taxi mail service, and other flying services.

CODE	OCCUPATION TITLE	MINIMUM WAGE RATE
	Aerial Photographer	11.39
	First Officer (Co-Pilot)	20.77
31010	Airplane Pilot	22.81

EXCEPT SCHEDULED AIRLINE TRANSPORTATION AND LARGE MULTI-ENGINE AIRCRAFT SUCH AS THE B-727, DC-8, AND THE DC-9.

ALL OCCUPATIONS LISTED ABOVE RECEIVE THE FOLLOWING BENEFITS:

HEALTH & WELFARE: $3.01 per hour or $120.40 per week or $521.73 per month

VACATION: 2 weeks paid vacation after 1 year of service with a contractor or successor; 3 weeks after 5 years, and 4 weeks after 15 years. Length of service includes the whole span of continuous service with the present contractor or successor, wherever employed, and with the predecessor contractors in the performance of similar work at the same Federal facility. (Reg. 29 CFR 4.173)

HOLIDAYS: A minimum of ten paid holidays per year: New Year's Day, Martin Luther King Jr.'s Birthday, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day, and Christmas Day. (A contractor may substitute for any of the named holidays another day off with pay in accordance with a plan communicated to the employees involved.) (See 29 CFR 4.174)

VACATION (Hawaii): 2 weeks paid vacation after 1 year of service with a contractor or successor; 3 weeks after 10 years, and 4 weeks after 15 years. Length of service includes the whole span of continuous service with the present contractor or successor, wherever employed, and with the predecessor contractors in the performance of similar work at the same Federal facility. (Reg. 29 CFR 4.173)

HEALTH & WELFARE (Hawaii): $1.32 per hour, or $52.80 per week, or $228.80 per month hour for all employees on whose behalf the contractor provides health care benefits pursuant to the Hawaii prepaid Health Care Act. For those employees who are not receiving health care benefits mandated by the Hawaii prepaid Health Care Act, the new health and welfare benefit rate will be $3.01 per hour.

HAZARDOUS PAY DIFFERENTIAL: An 8 percent differential is applicable to employees employed in a position that represents a high degree of hazard when working with or in close proximity to ordinance, explosives, and incendiary materials. This includes work such as screening, blending, dying, mixing, and pressing of sensitive ordance, explosives, and pyrotechnic compositions such as lead azide, black powder and photoflash powder. All dry-house activities involving propellants or explosives. Demilitarization,

EXHIBIT 7 (Con't)

modification, renovation, demolition, and maintenance operations on sensitive ordnance, explosives and incendiary materials. All operations involving regrading and cleaning of artillery ranges.

A 4 percent differential is applicable to employees employed in a position that represents a low degree of hazard when working with, or in close proximity to ordance, (or employees possibly adjacent to) explosives and incendiary materials which involves potential injury such as laceration of hands, face, or arms of the employee engaged in the operation, irritation of the skin, minor burns and the like; minimal damage to immediate or adjacent work area or equipment being used. All operations involving, unloading, storage, and hauling of ordance, explosive, and incendiary ordnance material other than small arms ammunition. These differentials are only applicable to work that has been specifically designated by the agency for ordance, explosives, and incendiary material differential pay.

** UNIFORM ALLOWANCE **

If employees are required to wear uniforms in the performance of this contract (either by the terms of the Government contract, by the employer, by the state or local law, etc.), the cost of furnishing such uniforms and maintaining (by laundering or dry cleaning) such uniforms is an expense that may not be borne by an employee where such cost reduces the hourly rate below that required by the wage determination. The Department of Labor will accept payment in accordance with the following standards as compliance:

The contractor or subcontractor is required to furnish all employees with an adequate number of uniforms without cost or to reimburse employees for the actual cost of the uniforms. In addition, where uniform cleaning and maintenance is made the responsibility of the employee, all contractors and subcontractors subject to this wage determination shall (in the absence of a bona fide collective bargaining agreement providing for a different amount, or the furnishing of contrary affirmative proof as to the actual cost), reimburse all employees for such cleaning and maintenance at a rate of $3.35 per week (or $.67 cents per day). However, in those instances where the uniforms furnished are made of "wash and wear" materials, may be routinely washed and dried with other personal garments, and do not require any special treatment such as dry cleaning, daily washing, or commercial laundering in order to meet the cleanliness or appearance standards set by the terms of the Government contract, by the contractor, by law, or by the nature of the work, there is no requirement that employees be reimbursed for uniform maintenance costs.

** NOTES APPLYING TO THIS WAGE DETERMINATION **

Under the policy and guidance contained in All Agency Memorandum No. 159, the Wage and Hour Division does not recognize, for section 4(c) purposes, prospective wage rates and fringe benefit provisions that are effective only upon such contingencies as "approval of Wage and Hour, issuance of a wage determination, incorporation of the wage determination in the contract, adjusting the contract price, etc." (The relevant CBA section) in the collective bargaining agreement between (the parties) contains contingency language that Wage and Hour does not recognize as reflecting "arm's length negotiation" under section 4(c) of the Act and 29 C.F.R. 5.11(a) of the regulations. This wage determination therefore reflects the actual CBA wage rates and fringe benefits paid under the predecessor contract.

Source of Occupational Title and Descriptions:

The duties of employees under job titles listed are those described in the "Service Contract Act Directory of Occupations," Fourth Edition, January 1993, as amended by the Third Supplement, dated March 1997, unless otherwise indicated. This publication may be obtained from the Superintendent of Documents, at 202-783-3238, or by writing to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Copies of specific job descriptions may also be obtained from the appropriate contracting officer.

REQUEST FOR AUTHORIZATION OF ADDITIONAL CLASSIFICATION AND WAGE RATE {Standard Form 1444 (SF 1444)}

Conformance Process:

The contracting officer shall require that any class of service employee which is not listed herein and which is to be employed under the contract (i.e., the work to be performed is not performed by any classification listed in the wage determination), be classified by the contractor so as to provide a reasonable relationship (i.e.,

EXHIBIT 7 (Con't)

appropriate level of skill comparison) between such unlisted classifications and the classifications listed in the wage determination. Such conformed classes of employees shall be paid the monetary wages and furnished the fringe benefits as are determined. Such conforming process shall be initiated by the contractor prior to the performance of contract work by such unlisted class(es) of employees. The conformed classification, wage rate, and/or fringe benefits shall be retroactive to the commencement date of the contract. {See Section 4.6 (C)(vi)} When multiple wage determinations are included in a contract, a separate SF 1444 should be prepared for each wage determination to which a class(es) is to be conformed.

The process for preparing a conformance request is as follows:

1) When preparing the bid, the contractor identifies the need for a conformed occupation(s) and computes a proposed rate(s).

2) After contract award, the contractor prepares a written report listing in order proposed classification title(s), a Federal grade equivalency (FGE) for each proposed classification(s), job description(s), and rationale for proposed wage rate(s), including information regarding the agreement or disagreement of the authorized representative of the employees involved, or where there is no authorized representative, the employees themselves. This report should be submitted to the contracting officer no later than 30 days after such unlisted class(es) of employees performs any contract work.

3) The contracting officer reviews the proposed action and promptly submits a report of the action, together with the agency's recommendations and pertinent information including the position of the contractor and the employees, to the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, for review. (See section 4.6(b)(2) of Regulations 29 CFR Part 4).

4) Within 30 days of receipt, the Wage and Hour Division approves, modifies, or disapproves the action via transmittal to the agency contracting officer, or notifies the contracting officer that additional time will be required to process the request.

5) The contracting officer transmits the Wage and Hour decision to the contractor.

6) The contractor informs the affected employees.

Information required by the Regulations must be submitted on SF 1444 or bond paper.

When preparing a conformance request, the "Service Contract Act Directory of Occupations" (the Directory) should be used to compare job definitions to insure that duties requested are not performed by a classification already listed in the wage determination. Remember, it is not the job title, but the required tasks that determine whether a class is included in an established wage determination. Conformances may not be used to artificially split, combine, or subdivide classifications listed in the wage determination.

** OCCUPATIONS NOT INCLUDED IN THE SCA DIRECTORY OF OCCUPATIONS **

Aerial Photographer

The aerial photographer must be skilled in reading flight maps, capable of assisting the pilot to adhere to flight lines, be able to level and operate a cartographic camera and its auxiliary equipment mounted in the aircraft so that the photographs that are taken will have the required forward lap and side lap for use in photogrammetric mapping equipment, and possess a working knowledge of aerial films and camera filters to insure proper exposure of the films.

First Officer (Co-Pilot)

Is second in command of commercial airplane and its crew while transporting passengers, mail, or other cargo on scheduled or nonscheduled flights. Assists or relieves an airline captain in operating the controls of an airplane; monitoring flight and engine instruments; and maintaining air-to-ground communications.

EXHIBIT 9

GLOSSARY AND DEFINITIONS

Acquisition Period: The calendar period in which the project item area imagery is required to be acquired.

Aerial Photography: Traditional film-based, vertical, high resolution imagery.

Camera System: The combination of lens, cone, magazine(s), and camera filter(s) which have been calibrated as an integral unit.

Contract Award Item: A separately awarded contract that may contain one or more project item areas awarded to a single contractor. Contract award items are indicated by the numeric solicitation number followed by sequential award item numbers (i.e., 3-04-1, 3-04-2, 3-04-3, etc).

Contracting Officer's Technical Representative (COTR): A person contract who has the responsibility of providing technical information such as site ground and weather conditions on a contract.

Contracting Officer's Representative (COR): A person who is responsible for specific technical and administrative duties related to a contract.

Direct Digital Imagery: Vertical, high resolution imagery directly captured using a digital sensor. Either airborne or space-borne systems.

Exposure Stations: Pre-determined locations where photo centers of individual frames are to be exposed.

Film Titling: Information annotated on the original aerial film pertaining to project item area and exposure identification.

Ground Sample Distance: The ground sample distance is the distance on the ground respresented by each pixel in the x and y components.

Original Photography: All aerial photography, as secured by the Contractor, prior to its inspection by the USDA, including any reflights made at the discretion of the Contractor.

Project Item Area: An area or areas described in the Schedule for which an award shall be made to one offeror.

Quarter Quadrangle: A full quadrangle is defined as a 7½ by 7½ minute area as established for the USGS topographic mapping series. A quarter quadrangle is one-fourth the size and is 3 minutes 45 seconds by 3 minutes 45 seconds.

Reflight Photography: Photography reflown to replace original photography rejected by USDA.

Remake Materials: Any contract materials, other than the original aerial film, ordered remade by USDA.

Stereomodel: The area covered by the conjugate images of three successive overlapping exposures.

PART IV - REPRESENTATIONS AND INSTRUCTIONS

SECTION K

REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF OFFERORS

K-1 ANNUAL REPRESENTATIONS AND CERTIFICATIONS (Jan 2006) (FAR 52.204-08)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is **541922**.

(2) The small business size standard is **$6.5 Million**.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b)(1) If the clause at 52.204-7, Central Contractor Registration, is included in this solicitation, paragraph (c) of this provision applies.

(2) If the clause at 52.204-7 is not included in this solicitation, and the offeror is currently registered in CCR, and has completed the ORCA electronically, the offeror may choose to use paragraph (c) of this provision instead of completing the corresponding individual representations and certifications in the solicitation. The offeror shall indicate which option applies by checking one of the following boxes:

[ ] (i) Paragraph (c) applies.

[ ] (ii) Paragraph (c) does not apply and the offeror has completed the individual representations and certifications in the solicitation.

(c) The offeror has completed the annual representations and certifications electronically via the Online Representations and Certifications Application (ORCA) website at http://orca.bpn.gov. After reviewing the ORCA database information, the offeror verifies by submission of the offer that the representations and certifications currently posted electronically have been entered or updated within the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201); except for the changes identified below [*offeror to insert changes, identifying change by clause number, title, date*]. These amended representation(s) and/or certification(s) are also incorporated in this offer and are current, accurate, and complete as of the date of this offer.

FAR CLAUSE #	TITLE	DATE	CHANGE
_____	_____	_____	_____

Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on ORCA.

(End of provision)

K-2 ADDRESS TO WHICH PAYMENT SHOULD BE MAILED

In the space provided below, the Contractor is requested to indicate the address to which payment should be mailed, or indicate "same" if it is the same as the address shown on the Solicitation, Offer and Award form (SF33 on page 1).

K-3 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998) (FAR 52.252-1)

This contract incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this address: www.arnet.gov/far.

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) PROVISIONS:

52.203-11 Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions (APR 1991)

52.204-05 Women-Owned Business (Other Than Small Business) (MAY 1999)

52.222-38 Compliance with Veterans' Employment Reporting Requirements (DEC 2001)

PART IV - REPRESENTATIONS AND INSTRUCTIONS

SECTION L - INSTRUCTIONS, CONDITIONS, AND NOTICES TO OFFERORS

L-1 TYPE OF CONTRACT (APR 1984)(FAR 52.216-01)

The Government contemplates award of an Indefinite Delivery, Indefinite Quantity (IDIQ), firm-fixed-price contract resulting from this solicitation. The contract will cover the base year (2007) and four option years (2008 through 2011).

L-2 INSTRUCTIONS FOR PREPARATION OF TECHNICAL AND PRICING PROPOSALS

The following instructions establish the acceptable minimum requirements for the format and content of proposals. Offeror's are advised to furnish all information in the sequence and format specified below. Failure to furnish all information requested may adversely affect the evaluation of the proposal. Proposals will be evaluated in accordance with the evaluation factors set forth in Section M of this solicitation.

2.1 General Instructions

(a) For the base year (2007) preparation of proposals, offeror’s shall submit a single proposal in response to the contract solicitation USDA-NAIP-3-07 and the task order solicitation NAIP-TO-3-07-1. Proposals will be evaluated based on the combined response to both documents. Contracts will be awarded prior to award of any task orders. Task orders are the method by which project item areas are awarded.

(b) All proposals must be prepared in two parts: Part I: Pricing Proposal, and Part II: Technical Proposal. Each part shall be separate and complete in itself so that evaluation of one may be accomplished independently from evaluation of the other. The technical proposal must not contain any reference to cost or price.

(c) All proposals should be precise, factual and responsive and must include, but is not limited to, the information listed below. Proposal content shall be organized in two separate parts and be submitted in the order indicated as follows:

2.2 PART I Pricing Proposal

Pricing information and related data shall be submitted as Part I of the offeror's proposal. For the base year (2007) the pricing proposal must contain two signed documents, a signed and dated Standard Form 33 (page 1 of the solicitation) with items 12 through 18 completed, and the task order pricing proposal (pages 1-3 of the task order solicitation) with quantities offered, unit price(s), and total price(s) for the item(s) indicated in the appropriate locations. Subsequent task orders will require only the signed task order pricing proposal for Part I.

2.3 PART II Technical Proposal

Response to the following technical statements will form the basis of a proposal's technical merit. Offerors are cautioned to address all requested information as complete and accurate as possible. Data contained in this solicitation and/or the task order solicitation documents shall be referenced in support of statements.

(a) Project Management Capability

(1) Statement of technical approach to project management that would assure timely completion and shipment of all work by or before the required delivery schedule. Statement should include detailed description of planned approach, procedures, management techniques, capacities, and specialized equipment and processes to be used in performance of the work.

(2) Statement of subcontractor management plan which includes a list of proposed subcontractors, what work they will perform, and how their performance will be managed and monitored.

(3) Scheduling and site basing of aerial photo crew and aircraft based on knowledge of the weather patterns during the acquisition period of the project area.

(4) Detailed overviews of film scanning process (if applicable), digital image processing procedures, and orthophotography production process of the acquired aerial photography.

(b) Past Performance History

(1) Past performance will be evaluated based on relevant performance history contained in USDA contract records of projects awarded by the FSA Aerial Photography Field Office. Offeror’s past performance will be evaluated according to project completion rates, delivery schedule compliance and general contractor performance regarding quality control, problem resolution, and communication.

(2) If no previous contracts have been held by the offeror with the Aerial Photography Field Office, list two (2) references with whom the offeror has held similar contracts. List past performance references in the space provided in the task order solicitation required documentation.

(3) If an offeror does not have, or have available, a past performance history, the offeror's proposal will not be evaluated favorably or unfavorably on past performance.

(c) Quality Control System

Detailed statement on Contractor quality control system that will insure all contract

materials submitted for inspection are in compliance with contract specifications. See Section C, Paragraph 1.1(c) for quality control requirements.

(d) Personnel Qualifications

List all professional and technical personnel intended to perform on this contract in the appropriate locations in the task order solicitation required documentation. Recommended list includes Project Manager, Aircraft Pilot(s), Aerial Photographer(s), and key back-up or support personnel. Brief resumes may be provided on separate papers for the personnel listed, stating name, title, education, past experience, and years of experience.

(e) Aircraft and Camera/Digital Sensor Availability

List all aircraft and cameras/sensors intended to be used in completion of this contract in the appropriate locations in the task order solicitation required documentation. If availability of equipment is contingent on other contractual commitments running concurrently with the work contemplated by this solicitation, indicate such in proposal statement. Unless otherwise stated, all aircraft and cameras/sensors listed will have exclusive availability for performance of the work as defined in this contract.

(f) Incomplete Contracts

List all incomplete contracts which require performance during the approximate photographic period indicated in the task order solicitation and affect equipment and personnel listed herein. List shall include project name, client, and remaining linear miles. Total remaining linear miles shall be summarized in the appropriate location in the task order solicitation document.

2.4 Solicitation Document and Supporting Data

The offeror's proposal must include the following required documentation, other information and supporting data as specified in this solicitation document and the task order solicitation document:

(a) Central Contractor Registration
(b) Online Representations and Certifications,
(c) Incomplete Contracts as of Date of Proposal,
(d) Aircraft to be Used in Completion of the Contract,
(e) Cameras or Digital Sensors to be Used in Completion of the Contract,
(f) Past Performance References (if required),
(g) Key Personnel to Perform on the Contract.
(h) Camera Calibration Report(s),
(i) Current Financial Statement,
(j) Digital Sensor Sample Imagery

L-3 TASK ORDER PROCEDURES

The Government will use a structured method of evaluating and determining award areas and quantities of task orders under the resulting multi-award contracts. All Contractors will be provided a fair opportunity to receive task order awards. The procedures explained below represent the Government's approach to task order award determinations. Through Government and Contractor cooperation, it is anticipated that innovative approaches incorporating lessons learned may result in more efficient and effective performance of the work.

3.1 Base Year (2007) Procedures

(a) Offers shall be submitted by Contractors as part of their contract proposal to furnish aerial photography and digital imagery processing services in project item areas (states) that they can successfully complete given their current capacities, area of interest, and delivery schedule. The offer will include a pricing proposal that is based upon project item areas of interest.

(b) Negotiation of proposed pricing, areas offered, and quantities shall be conducted using the source selection criteria specified in Section M. This source selection process will be used as a basis for contract award and task order award. Only proposals submitted by Contractors whose overall scores are within the competitive range shall be considered for negotiation (see Section M-1.2, Competitive Range). Inclusion in negotiations does not guarantee a contract award. Negotiations shall be performed by oral communication with the Contracting Officer followed by faxed or e-mailed confirmation of agreement.

(c) Task orders awards for negotiated prices, areas, and quantities will be issued immediately following contract awards by the authorized Government Contracting Officer.

3.2 Option Year (2008 and 2011) Procedures

Task orders for the four option year periods shall be issued in accordance with the following procedures:

(a) A Task Order Request for Proposal (RFP) containing statements of work will be provided to contractors at the beginning of the new contract performance period. The RFP will briefly describe for the new option year estimated quantities, acquisition periods, delivery schedules, and any other significant changes from the prior year requirements that are within the scope of the contract.

(b) Contractors will be required to respond to the task order statement of work similar to the original RFP covering terms of pricing, areas of interest, technical statements, and performance capacities.

(c) Task order proposals submitted by the Contractors will be evaluated to determine a new technical score, then updated with revisions to past performance based on their

performance on task orders during the prior contract year. Contractor submitted pricing, areas of interest, estimated quantities, and delivery schedules will be evaluated and negotiated, resulting in task order awards. The goal of these procedures is to provide all Contractors a fair opportunity for task order awards that provide the Government the best value.

L-4 CONTRACT DIFFICULTIES AND CONTINGENCIES

Offerors are cautioned to examine the solicitation, visit the work location if necessary, and evaluate the facilities needed and difficulties attending the execution of the proposed contract. Considerations include local conditions, uncertainty of weather, availability of landing fields, restricted air space, and all other contingencies.

L-5 SERVICE OF PROTEST (AUG 1996) (FAR 52.233-2)

Protests, as defined in Section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO) shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from; Director, Acquisition Management, USDA/FSA/MSD/AG Code 0567, P.O. Box 2415, Washington, D.C. 20013-2415.

The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

L-6 INQUIRIES (FEB 1988) (AGAR 452.204-70)

Inquiries and all correspondence concerning this solicitation should be submitted in writing to the Contracting Officer. Offerors should contact only the contracting officer issuing the solicitation about any aspect of this requirement prior to contract award.

L-7 BEST PRACTICES DOCUMENTS

Documents providing “Best Practices” direction and guidance, with recommendations for improving image quality, production processes, or other orthoimagery related issues and methodologies, will be furnished as part of the solicitation documentation package or on a linked webpage for reference. Contractor’s aerial photography acquisition and orthoimagery production processes and procedures will be reviewed with reference to these published “Best Practices” documents.

L-8 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998) (FAR 52.252-1)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this address: www.arnet.gov/far.

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) PROVISIONS:

52.204-06 Data Universal Numbering System (DUNS) Number (JUN 1999)

52.215-01 Instructions to Offerors - Competitive Acquisition (MAY 2001)

PART IV - REPRESENTATIONS AND INSTRUCTIONS

SECTION M - EVALUATION FACTORS FOR AWARD

M-1 PROPOSAL EVALUATION

Proposal evaluation is an assessment of the proposal and the offeror's ability to perform the prospective contract successfully. The Government shall establish an evaluation team that includes appropriate contracting, technical, program, and other expertise to ensure a comprehensive evaluation of proposals.

1.1 Technical Evaluation Team

The Technical Evaluation Team will evaluate, and rank according to technical merit, all proposals in accordance with the evaluation factors established in this solicitation. The team will not have access to the pricing proposal during the technical evaluation process. The offeror's proposal shall be in the format prescribed in Section L and shall contain a response to each of the areas identified.

1.2 Competitive Range

The Contracting Officer shall establish the competitive range based on ratings of each proposal against all evaluation criteria including price. The competitive range shall be comprised of all of the most highly rated proposals. The competitive range can be limited for purposes of efficiency (see FAR 52.215-1(f)(4)). If negotiations are conducted in the source selection process they shall occur after establishment of the competitive range.

1.3 Source Selection Decision

The Contracting Officer shall select for purposes of contract award the overall superior proposal which offers the "best value" to the Government, price and other factors considered. The decision shall be based on a comparative assessment of proposals against all source selection criteria in the solicitation.

M-2 EVALUATION FACTORS

Proposals shall be evaluated according to the following criteria including all supporting information furnished by the offeror with the proposal. The evaluation criteria are listed in descending order of importance with relative point values indicated. See Section L for instructions for preparation of technical and pricing proposals.

2.1 Technical Evaluation

Evaluation Criteria	Relative Point Value
(a) Project Management Capability	25
(b) Past Performance History	25
(c) Quality Control System	20
(d) Personnel Qualifications	10
(e) Aircraft and Camera Availability	10
(f) Incomplete Contracts	10
	100

2.2 Price Evaluation

While technical excellence is considered more significant than price, the proposed price between technically superior proposals shall be an important factor in selection of a proposal for award. The Government reserves the right to make an award to other than the lowest priced offeror, or other than the highest technically rated offeror, when the perceived benefits and tradeoffs provide the Government the greatest value.

Based on comparative evaluations of the pricing proposals for the basic and optional award item requirements (see Task Order Solicitation), the Government will consider for award that offer that represents the greatest value and is determined to be in the best interest and the most advantageous to the Government.

Offerors are cautioned to insert the unit price and the total price for the Project Item Area(s) in the appropriate locations in the Task Order Solicitation. In case of discrepancy between a unit price (price per DOQQ) and an extended price (total price), the unit price will be presumed to be correct, subject, however, to correction to the same extent and in the same manner as any other mistake.

2.3 Other Factors

The Contracting Officer will consider, in addition to the evaluation criteria, the prospective Contractor's responsibility record in terms of financial resources, business integrity and ethics, and other standards, as defined in the Federal Acquisition Regulation, Part 9.

M-3 EVALUATION EXCLUSIVE OF OPTIONS (APR 84) (FAR 52.217-3)

The Government will evaluate offers for award purposes by including only price for the base requirement; *i.e.*, options will not be included in the evaluation for award purposes.

M-4 CONTRACT AWARD

The Government intends to evaluate proposals and award a contract or contracts resulting from this solicitation after conducting discussions with offerors whose proposals have been determined to be within the competitive range.

4.1 Contract Award

The contracts will be awarded to those responsive and responsible offerors whose proposals represents the greatest value and is determined to be in the best interest and the most advantageous to the Government, price and other factors considered.

4.2 Possibility of Award Without Discussion

Notice is given to all offerors that there is a possibility that award may be made without discussion or further negotiation. Proposals should be submitted initially on the most favorable terms, from a price and technical standpoint, which the offeror can submit to the Government.

4.3 Required or Requested Information

Award will be made only in conjunction with proposals from responsible prospective Contractors. Failure to provide the information, material, and/or documentation either required in the solicitations, or requested by the Contracting Officer, within eight (8) calendar days of the request, may result in the proposal being rejected.

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ATTACHMENT A

NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) SPECIFICATION FOR FILM BASED ACQUISITION

(Dated February 16, 2007)

1.0 USDA AERIAL CAMERA SPECIFICATION

Film-based cameras used for acquiring aerial photographs are required to be tested and calibrated. Camera systems must be compatible with precision stereoscopic mapping instruments and with analytical mensuration procedures used in photogrammetric surveys and in preparing accurate orthophotography. Only camera systems which meet the requirements of these specifications, as determined by a current U.S. Geological Survey (USGS) "Report of Calibration" test report, shall be used

1.1 Aerial Camera and Filter

(a) Required Camera Lens Focal Length: Camera must use lens focal length of either a 153 mm (6 inch), 210 mm (8¼ inch), or 305 mm (12 inch) along with an antivignetting filter for color positive film, and an antivignetting and Kodak Wratten No. 12 (minus blue), or equal filter for color infrared positive film.

(b) Camera systems must be compatible with precision stereoscopic mapping instruments and with analytical mensuration procedures used in photogrammetric surveys and in preparing accurate topographic maps.

(c) Proposed camera systems will be evaluated to determine if they meet the contract specifications, based on a current USGS camera calibration test report. The Contracting Officer shall have the right to require the removal of a camera from use when deficiencies in photographic imagery attributable to the camera are found to exist. Any camera removed from use by the Contracting Officer shall not be returned to use on USDA projects until the cause of the malfunction is corrected to the satisfaction of USDA. That determination will be based on acceptable samples and/or an additional test by the Optical Science Laboratory of the USGS, if directed by the Contracting Officer.

1.2 Camera Operation

The camera and its mount shall be checked for proper installation prior to each mission. Particular attention shall be given to electrical circuits which control fiducial and camera data box lights and to the vacuum supply. In conformance with conventional photogrammetric practice, it is the preference of the Government that the contractor use camera configurations, that when installed in the aircraft, advances film parallel to the line of flight.

1.3 Camera Accessories

(a) Automatic Exposure Control. An automatic exposure control device is permitted, but a manual override capability is required for some types of terrain to achieve proper exposure.

(b) Camera Mount. The camera mount shall be regularly serviced and maintained and shall be insulated against aircraft vibration.

(c) Camera Port Glass. Aircraft camera port glass shall be preferably 50 mm thick but not less than 32 mm thick. The surface finish shall be 80/50 or better. Glass material shall be polished crown, group category M, Mil Specs Mil-W-1366F (ASG), dated October 1975, C-1 optical quality or better.

1.4 Camera System "Report of Calibration"

One copy of the "Report of Calibration" from the USGS, for any camera system to be used, is required to be either on file at the USDA, or submitted with the contractor's offer. A camera system "Report of Calibration" will not be acceptable if more than three (3) years old at the scheduled date for receipt of offers.

1.5 Calibration Tests

Tests to determine compliance with these specifications will be performed by the Optical Science Laboratory of the USGS. The fee for the tests and the arrangements to have the tests performed are the responsibility of the contractor. Delays encountered in having camera systems tested by the USGS Optical Science Laboratory will not be considered reason for the USDA to accept offers lacking such reports. Each camera system submitted for calibration shall be accompanied by all magazines and filters that might be used with the camera. Controls and camera mounts should not be submitted unless requested by the calibrating laboratory. Instructions for operation of the camera, including directions for holding the shutter open for laboratory tests, shall accompany each camera unless ascertained to be on file with the calibrating laboratory.

(a) Interval Between Tests. The interval between tests for camera system calibrations shall not exceed three (3) years, unless otherwise approved by the Contracting Officer. However, when there is any reason to believe that the dimensional relationship of the lens, fiducial marks, and film plane have been disturbed by partial disassembly or unusual mechanical shock, the camera must be submitted for recalibration at contractor expense.

(b) Contact for Calibration Tests

U.S. Geological Survey
Optical Science Lab Manager
518 National Center
Reston, VA 20192
Phone: 703-648-4692

Fax: 703-648-4155
Email: OSLab@usgs.gov

(c) Shipping Address for Calibration Tests

U.S. Geological Survey
Optical Science Lab
12201 Sunrise Valley Drive
Room BB-122
Reston, VA 20192
Phone: (703-648-4692)

1.6 Constructional Design Necessary to Permit Testing

To permit testing for determination of calibrated focal length, distortion, resolving power, fiducial mark locations, and stereo model flatness, the constructional design of the camera shall be as follows:

(a) Focal Plane. The focal plane shall be accessible from the rear so that a telescope placed behind the camera may view objects in front of the lens, limited only by the size of the focal plane opening. It shall be possible to place the surface of an optical flat having a thickness of 31 mm (1¼ inch.) on the focal plane of the camera.

(b) Focal Plane Frame. The focal plane frame shall be so constructed as to permit placement of a glass photographic plate on its surface so that the emulsion surface of the glass photographic plate lies in the true focal plane of the camera. The size of the frame image shall be 23 x 23 cm (9 x 9 inches).

1.7 Camera Components Required for Testing

(a) Lens Cone Assembly. The lens cone assembly must be so constructed that the lens and fiducial marks comprise an integral unit. The design of the lens cone shall be such that it maintains the required precise relationship between the lens, fiducial marks, and focal plane on which the film platen shall be positioned. Construction shall be such as to maintain the dimensional relationship of these components under normal conditions of transportation, handling, and use, which can include considerable mechanical and thermal shock. The structure holding these components shall be supported in use in such a manner that stresses likely to change the required dimensional relationships cannot be transmitted to it from the supporting body or mount. The lens cone assembly shall be so designed and manufactured that all parts will return precisely to their original positions, should it be necessary for any reason to disassemble it. However, any disassembly of the lens cone assembly shall require recalibration at contractor's expense before further use.

(b) Film Platen. Cameras shall be equipped with an approved means of flattening the film at the instant of exposure. The platen against which the film is held shall not depart by more than ±0.013 mm from a true plane, when the camera/magazine vacuum is applied.

(c) Shutter. The camera shall be equipped with a between-the-lens shutter of the variable-speed type. The range of speed settings shall be such that, for all anticipated combinations of flight heights, aircraft speeds, film speeds, and light conditions, the camera will produce high-resolution photographs. The effective exposure time and efficiency of the shutter as mounted in the camera will be measured at a maximum aperture and shall have a minimum efficiency of 70 percent at a speed of 1/200 second. This test shall be made in accordance with the "American National Standard Shutter Tests for Still-Picture Cameras," Method I, approved January 12, 1972, American national Standards Institute (PH3.48-1972) (R1978). The shutter shall have a speed of 1/400 second and slower for exposing film negatives during calibration.

(d) Fiducial Marks. Either four or eight fiducial marks are required. If the four fiducial marks are in the corners of the format area, there must be a set of marks (V-notches or equivalent) in the frame at the midsides for use in centering diapositives in a stereoplotter. If there are eight fiducial marks, the corner fiducial marks shall form a quadrilateral whose sides are equal within ±0.500 mm. The midside fiducial marks shall be equidistant within ±0.500 mm from the adjacent corner fiducial marks. All fiducial marks and other marks intended for precise measuring shall be clear and well-defined on the aerial film and shall be of such a form and contrast that the standard deviation of repeated reading of the coordinates of each made on a precision comparator shall not exceed 0.002 mm. For cameras with projection type fiducial marks the projected images of all marks must be in sharp focus on the emulsion surface. Drawings in Figure 2 show acceptable fiducial marks and their arrangements. Fiducials without a center point mark or intersecting lines will not be acceptable. Glass or plastic mounts for fiducial marks will not be acceptable.

(1) The lines joining opposite pairs of fiducial markers shall intersect at an angle within one minute of 90 degrees. (See Figure 3)

(2) The intersection of lines between fiducials--the indicated principal point--shall not be further than 0.030 mm from the point of autocollimation. (See Figure 3)

(e) Filter. Only glass filters with metallic antivignetting coating shall be used to reduce the illumination for uniform distribution of light over the focal plane format. A microdensitometer trace will be made from the antivignetting coating side of the filter to determine if any deterioration is present that would affect the uniformity of illumination in the focal plane. Deteriorations in excess of 50% of the height of the nominal curve for a lease type will be reason for rejection of a filter. The surface with the antivignetting coating shall be toward the camera lens. The filter shall have surfaces parallel within 10 seconds of arc, and its optical quality shall be such that its addition to the camera shall enhance the uniformity of focal plane illumination and not cause a reduction in image resolution. Glass filter combinations which may be required will be specified in the contract.

1.8 Lens and Platen/Magazine Identification

The camera or lens number, and the most recent calibrated focal length shall be recorded clearly on the film for each frame either on the inside of the focal plane frame or on a data

strip between frames. An alpha numeric mark (or symbol) contained in the platen/magazine which identifies the platen/magazine may also be recorded if available on each frame of film. Data markers located on the inside of the focal plane frame shall not exceed 6.35 mm (0.25 inch) in height and 25.4 mm (1.0 inch) in length and shall not obscure any part of the fiducial marks.

1.9 Optical Requirements

Cameras will be given both a static and an operational type test made after final assembly of all parts of the camera system with the light filter in place on the lens. All tests of the lens cone assembly for determination of the calibration constants, calibrated focal length, distortion and resolution will be made using high contrast targets and Eastman Kodak Spectroscopic emulsion Type 157-01 on Kodak Aerial Calibration Plates. Cameras will be operationally tested for stereo model flatness and resolution by exposing Eastman Kodak Double-X Aerographic film 2405 in the camera while mounted on a multicollimator camera calibrator. (The optical requirements for distortion, model flatness, and resolution for various focal length cameras are defined and tabulated in Table 1.) The camera focal length stated in the contract must meet the minimum requirements for that focal length as shown in Table 1.

(a) Distortion

(1) Radial. The distortion in image position as measured along radial lines from the principal point of symmetry. The value of the average radial distortion referred to the calibrated focal length shall not exceed the amount shown in Table 1.

(2) Decentering. The distortion in image position as measured perpendicular to radial lines from the principal point of symmetry. The value of the decentering distortion shall not exceed the amount shown in table 1. This value shall be evaluated for 153 mm cameras only.

(b) Point of Symmetry. The calibrated principal point — the point of symmetry — shall not be further than 0.020 mm from the point of autocollimation for 153 mm focal length lenses and no further than 0.040 mm for all other focal length lenses. (See Figure 3/Table 1)

(c) Resolution. Radial and tangential resolving power, in line pairs per millimeter, shall be no less than the value listed in Table 1 for each focal length lens.

(d) Test Aperture. All camera-lens calibration tests shall be made at the maximum aperture specified by the manufacturer for that lens.

(e) Model Flatness. The model flatness test will be performed only for 153 mm and 88 mm cameras. Diapositives will be printed from two film exposures of the collimator targets on micro flat glass plates. Two stereo models will be analytically formed from these using different halves of the exposures for each model. Each model thus formed will consist of a small fixed number of symmetrically arranged points. The allowable deviation from flatness, taken as the range between the maximum negative and the

maximum positive value shall be no greater than ± 1/8000 of the focal length of a nominal 6 inch (153 mm) camera, or ± 1/5000 of the focal length of a nominal 3½ inch (85-88 mm) camera. If elevation discrepancies exceed this value, the camera will not be acceptable. (See Table 1.)

2.0 AERIAL FILM

All aerial film used on a project item shall be from one manufacturer and purchased by the Contractor. Extreme care shall be exercised to insure proper exposure and processing of film in accordance with manufacturer's recommendations.

2.1 Approved Aerial Film:

(a) Color Positive Film: Kodak Aerochrome III MS Film 2427, Agfa Aviphot Chrome 200 PE1, or equal.
(b) Color Infrared Positive Film: Kodak SO-734 Aerochrome III Infrared NP, or equal.

2.2 Salient Film Characteristics

(a) Only very fine grained, unexpired, polyester base films shall be used. The film base shall have a nominal thickness of 4 mils and be 24.1 cm (9.5 inch) wide. The color and color infrared positives shall be of such quality to produce sharp, color images that provide maximum image detail.

(b) The natural color positive film will have a diffuse rms granularity value of 13 or lower (read at a net green diffuse density of 1.0 with a 48-micron aperture). Color emulsions shall be balanced for daylight exposure and the spectral sensitivity will cover the entire visible spectrum to 700 nanometers or greater.

(c) The color infrared positive film will have a diffuse rms granularity value of 23 or lower (read at a net diffuse density of 1.0 with a 48 micrometer aperture). Color infrared emulsions will be sensitive to ultraviolet, visible, and infrared radiation to 900 nanometers or greater.

2.3 Processing

All aerial film shall be processed under controlled sensitometric conditions, to achieve consistent and even development. All film shall be exposed and processed to the manufacturer's specifications. Modified or non-standard processing is not permitted. Prior to processing, a 21-step sensitometric wedge (in 0.15 density increments) shall be exposed on each roll of film processed and shall remain in the roll when delivered to USDA. Any rolls of film cut or spliced, to minimized the number of film cans delivered to the Government, shall indicate on the film can label the roll number that contains the sensitometric wedge. A leader of at least one (1) meter (3 feet) shall be retained on each end of the roll.

2.4 Film Densities

Density measurements will be taken on transparencies using a transmission densitometer with a 1 mm aperture for scales smaller than 1:36,000. Readings will be made no closer than 38 mm (1.50 inches) from the image edge.

All film for each project item shall be from the same emulsion batch. All pertinent exposure information shall be supplied to the processing laboratory. The film shall be processed as soon as possible after exposure to avoid undesirable changes in the latent image.

(a) Color Positive Film. All minimum (D-min) and maximum (D-max) densities as measured on the original aerial film transparencies using status A filters shall be no lower nor higher than the values provided below. All density values include the Base + Stain value.

Filter	Base + DMin (± 0.10)	Base + DMax (± 0.10)
Visual	0.73	1.57
Red	0.70	1.57
Green	0.75	1.47
Blue	0.94	1.62

(b) Color Infrared Positive Film. All minimum (D-min) and maximum (D-max) densities as measured on the original aerial film positives using status A filters shall be no lower nor higher than the values provided below. All density values include the Base + Stain value.

Filter	Base + DMin (± 0.10)	Base + DMax (± 0.10)
Visual	0.60	2.32
Red	0.61	2.26
Green	0.57	2.31
Blue	0.48	2.23

2.5 Storage and Handling

(a) Aerial Film. Storage, exposure, and handling of all photographic materials shall be in accordance with the manufacturer's recommendation. The film shall be placed on spools with the emulsion facing the core of the spool and shall not be rolled tightly or in any way stretched, buckled, distorted, or exposed to excessive heat. The processed film shall be free from handprints, fingerprints, smudges, and other handling marks.

If there are no manufacturer’s recommended procedures, the contractor shall:

(1) Film shall be kept refrigerated in a waterproof container until one day before being exposed and returned to cold storage after exposure until processed.

(2) Cold storage temperature shall not be higher than 55° Fahrenheit (13° Celsius). The film shall be processed as quickly as possible after exposure.

(b) Film Containers. All rolls of aerial film shall be contained in Contractor furnished sturdy, cylindrical plastic cans.

(c) Film Can Labels. Film can labels shall be securely affixed to the side of each can and positioned so that the label can be read when the film can is standing with the lid end up (see Figure 1). The Contractor shall type or neatly letter each film can label with the required information according to the format example. Blank labels will be available from the Government.

2.6 Dimensional Stability

The dimensional change in any direction across a 23 cm (9 inch) distance shall not exceed 0.13 mm (0.005 inch) at 18-24° Celsius (65-75° Fahrenheit) and 45-55% relative humidity.

2.7 Physical Quality

All aerial film shall be free from chemicals, stains, tears, scratches, abrasions, water marks, finger marks, lint, dirt, and other physical defects. The imagery shall be clear and sharp in detail and uniform in density. It shall be free from light streaks, static marks, and other defects that would interfere with the intended purpose. All film shall be thoroughly fixed and washed to insure freedom from chemicals and shall be of archival quality. Film or prints found to contain an excess of residual chemicals, by testing in accordance with manufacturer's procedures, may be rejected or returned to the Contractor for refixing and rewashing. The use of any adhesive tape product, such as masking tape, which leaves residual adhesive on the film is prohibited.

2.8 Composition of Film Roll

More than one project item area from a single contract award item may be placed on a single roll. All aerial film on any one roll shall have the same roll number and shall consist only of exposures made with the same camera system (lens, cone, and magazine). Every exposure within a roll of film shall be titled regardless if it is rejected or unused for coverage.

One (1) meter (3 feet) of blank or unused film shall be left beyond the first and last used exposure on each roll or segment to serve as leader and trailer. Some unexposed film must be retained at the beginning or end of a roll for the step wedge which is required for controlled processing.

Film spools having a flange diameter of approximately 13.2 cm (5-3/16 inches) shall be used, and only that length of film which can be wound on a spool without strain, leaving at least 3.2 mm (1/8 inch) of flange exposed, shall be placed on each spool.

For Color Infrared Film ONLY. A minimum of four (4) run-off exposures shall be made before the first usable exposure on a mission and at the beginning of each new roll. A minimum of four run-off exposures between usable exposures is required if mission is interrupted by more than 30 minutes and/or if splicing is necessary.

2.9 Splicing Film

Splicing shall be accomplished with 19 mm (¾ inch) pressure sensitive polyester base tape. The splices shall be of the butt-joint type with tape placed on both sides of the splice. Particular care shall be given to the alignment of the film when splicing, with care taken to trim all excess binding tape in order that the film will be perfectly straight after splicing. A splice shall not be closer than 13 cm (5 inches) from the image edge of any accepted frame.

3.0 TITLING OF AERIAL FILM

Every exposure within a roll shall be titled regardless if acceptable or unacceptable, used or unused, rejected or accepted. Electronic titling is not acceptable.

3.1 Required Titling

Each exposure shall be clearly titled in accordance with the following format example sketch and required project data:

For Color Positive Film:

+	MM-DD-YY	12:00	USDA-FSA	+	40	NAIP07	01001-222	+

For Color Infrared Positive Film:

+	12:00	MM-DD-YY	NAIP07	+	01001-222	40	USDA-FSA	+

Date: Month-Day-Year in standard numeric notation (MM-DD-YY).
Time: The local standard time of exposure shall be titled only on the first and last used exposure in each strip and at each break in flight line, including breaks due to reflights.
Agency Designator: Government agency acronym as specified.
Scale: Nominal photographic scale represented by two digits to nearest thousand.
Project Code: Project Code NAIP (National Agriculture Imagery Program) followed by the task order fiscal year designator (Example: NAIP07, NAIP08, NAIP09, etc.)
Roll Number: Number in series, preceded by the last two digits of the Task Award Number (padded by leading zeros) which shall be designated upon award. (Example:

Task Award Number 3-07-1 -- 01001, 01002, 01003; Task Award Number 3-07-2 – 02001, 02002, 02003, and Task Award Number 3-07-3 -- 03001, 03002, 03003). Exposure Number: Number in unbroken series beginning with 1, not 001 or 01.

3.2 Type and Size of Characters and Application

The characters used in titling shall be standard block lettering 6.35 mm (¼ inch) high. They shall be sharp, legible, and uniformly applied with non-flaking black ink. The titling shall be placed on the non-emulsion side of the film and may be applied by use of an ink drawing pen or stamp. No smears or transfer of marking ink to other parts of the film roll will be permitted. Heat transfer lettering devices may only be used if prior consent is obtained from the Contracting Officer.

3.3 Location of Titling Characters

(a) Color Positive Film: Identifying data shall be placed in line along the most northerly inflight (end lapped) edge of the aerial exposures of north-south flights. Titling shall be positioned so that the characters are 2.5 mm (1/10 inch) from the image edge and 2.5 mm (1/10 inch) from the corner fiducials.

(b) Color Infrared Positive Film: Identifying data shall be placed in line along the most northerly inflight (end lapped) edge of the aerial exposures of north-south flights. Titling shall be positioned so that the characters are 2.5 mm (1/10 inch) from the image edge and 6.35 mm (¼ inch) from the corner fiducials.

3.4 Assigning Roll Numbers

All rolls of film submitted shall be numbered consecutively beginning with the first number of those assigned above. Rolls of film used in the photography of reflights shall also be numbered consecutively starting with the next highest roll number as assigned to the original rolls.

3.5 Rejected or Not Used Exposures

Every exposure within a roll shall be titled regardless if unused or used, rejected or accepted. No exposure shall be removed from the roll unless authorized by the Contracting Officer or representative.

4.0 ACQUISITION & FLIGHT PLAN REQUIREMENTS

The contractor is responsible for all necessary flight planning, including, but not limited to determination of photographic scale, exposure stations, altitudes, and flight directions, required to acquire the imagery in accordance with the technical requirements stated herein

4.1 Project Area(s) To Be Photographed

The boundaries and exact coverage of any specified area(s) will be described in the individual task order.

4.2 Overlap Requirements

Stereoscopic coverage of successive and adjacent overlaps of photographs shall be obtained by and meet the following overlap requirements:

	Minimum	**Maximum**	**Optimum**
Endlap	57%	67%	62%
Sidelap	15%	45%	32%

4.3 Reflight Photography

Reflights for aerial photography shall be centered over the predetermined exposure stations with no less than the allowable deviation stated above. All flight segments shall consist of no less than three (3) exposures in length.

4.4 Crab

Any series of two or more photographs crabbed in excess of five degrees (5°) as measured between photographs in line and between adjoining lines may cause rejection of any or all of that particular flight line.

4.5 Tilt

Exposure made with the optical axis of the camera in a vertical position is desired. Tilt (departure from the vertical) of any exposure exceeding four degrees (4°) or relative tilt between any two successive exposures exceeding six degrees (6°) may be cause for rejection of any or all of the flight line. Tilt shall not average more than two degrees (2°) in any 16 km (10 mile) section of a flight line and shall not average more than one degree (1°) for the entire project.

5.0 FILM SCANNING REQUIREMENTS

The scans shall be clear and sharp in detail with uniform density, and free from dirt and other defects in the digital imagery in accordance with the following requirements:

5.1 1-meter Orthorectified Digital Imagery. All 1-meter ground sample distance (GSD) GeoTIFF images, from the aerial photography shall be scanned such that the final product results in a 25 micrometer resolution.

5.2 2-meter Orthorectified Digital Imagery. All 2-meter ground sample distance (GSD) GeoTIFF images, from the aerial photography shall be scanned such that the final product results in a 50 micrometer resolution.

5.3 Images shall be scanned such that a full histogram is acquired without clipping highlight or shadow details.

5.4 Images shall be scanned and saved at the maximum bit depth allowed by the scanner in order to ensure that information is not lost in the tonal and color balance steps due to quantization.

6.0 PROJECT DATA FILES

6.1 Photo-Center Data File. A photo-center data file shall be created with the minimum attributes:

DESCRIPTION	MAXIMUM NUMBER OF CHARACTERS IN FIELD
Project Code (NAIP<YY>)	6
Film Roll Number	5*
Exposure Number	3
Date of Exposure (YYYYMMDD)	8
Camera Lens Serial Number	10
Calibrated Focal Length in millimeters (mm)	7
Latitude (DD.DDDDD)	8
Longitude (- DDD.DDDDD (Negative))	10
Flight Altitude in meters at camera (MMMMM.MM; AGL)	8
Exposure used for quarter quadrangle tile creation (Y/N)	1**

* Roll number should be padded with leading zeros.
** The exposure used to create an image (marked "Y" as indicated above) must record the accurate photo date from the film and be reflected within the photo-center data file.

Example:
NAIP07,01001,222,20040721,0996W-0572,12345678,153.002,42.71936, -123.41498, 07048.63,Y

6.2 Scan Data File. A scan data file shall be created that list all scanned images required during imagery production and at a minimum include the following attributes:

DESCRIPTION	MAXIMUM NUMBER OF CHARACTERS IN FIELD
Scan File Name:	30
Film Roll:	5*
Exposure Number:	3
Samples = Columns:	4
Lines = Rows:	4

* Roll number should be padded with leading zeros.

Example: c_3509320_ne_15_1_20040721.tif,01001,203,4759,4821

FIGURE 1
FILM CAN LABEL

FILM CAN LABEL			
SOLICITATION AND PROJECT ITEM NO. **0103**			ROLL NO. **0103**
STATE **MO / KS**	NOMINAL SCALE **1:40,000**	FILM TYPE **COLOR POS**	
LENS NO. **Uag ###**	CAMERA NO. **#####**		CAMERA MAKE **Ziess**
CALIBRATED FOCAL LENGTH **150.000**	USGS REPORT NO. **OSL/###**		USGS REPORT DATE **24-MAY-02**
PROJECT NAME	CODE	EXPOSURE NOS.	DATE EXPOSED
MO	**NAIP04**	**1-200**	**01-JUL-04**
KS	**NAIP04**	**201-225**	**02-JUL-04**
CONTRACTOR:			

USDA-FSA-AERIAL PHOTOGRAPHY FIELD OFFICE APFO-55 (2000)

INSTRUCTIONS: PLEASE COMPLETE ALL BOXES THAT ARE APPLICABLE.

FIGURE 2
EXAMPLES OF ACCEPTABLE FORMS OF FIDUCIAL MARKS

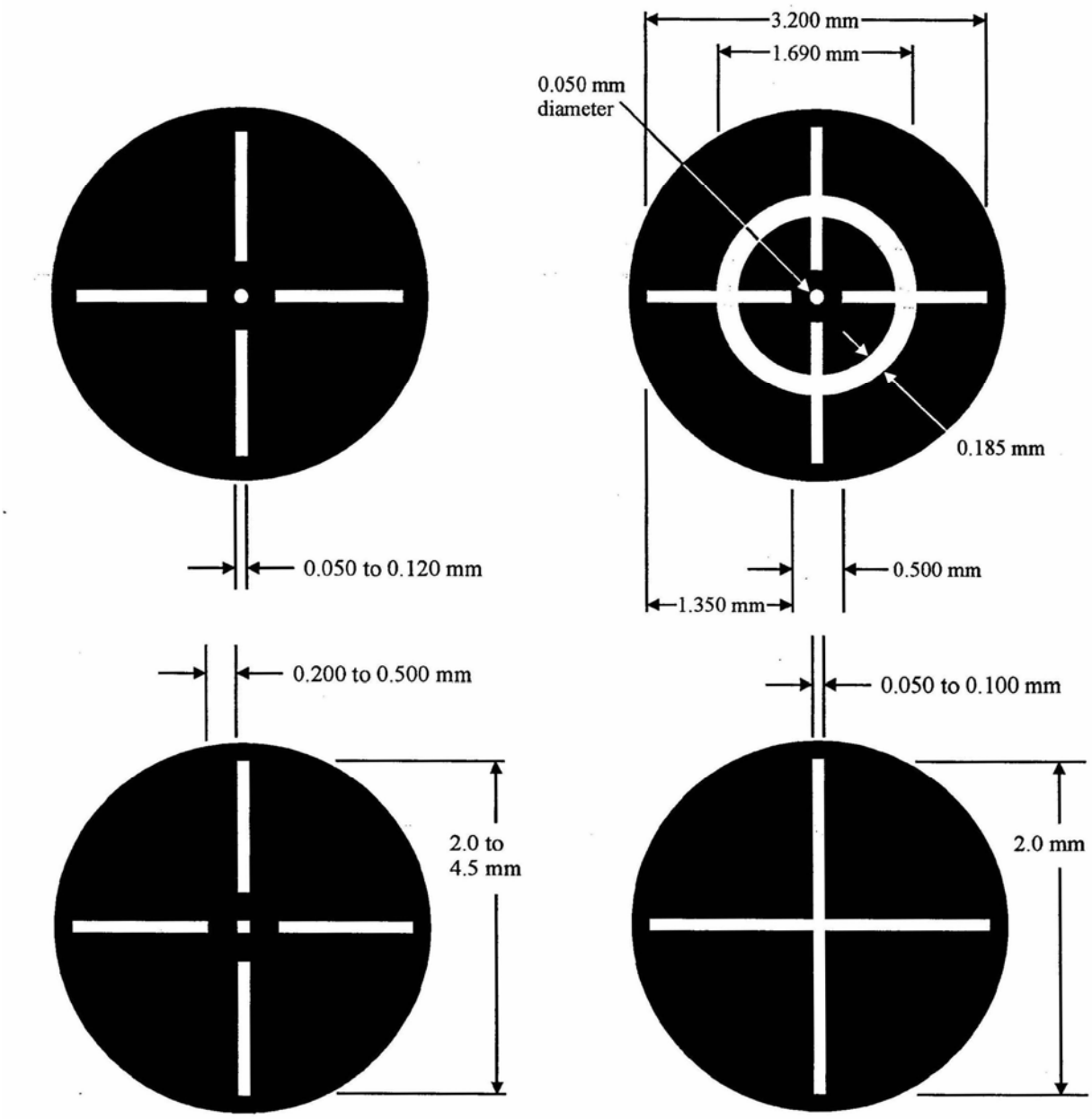
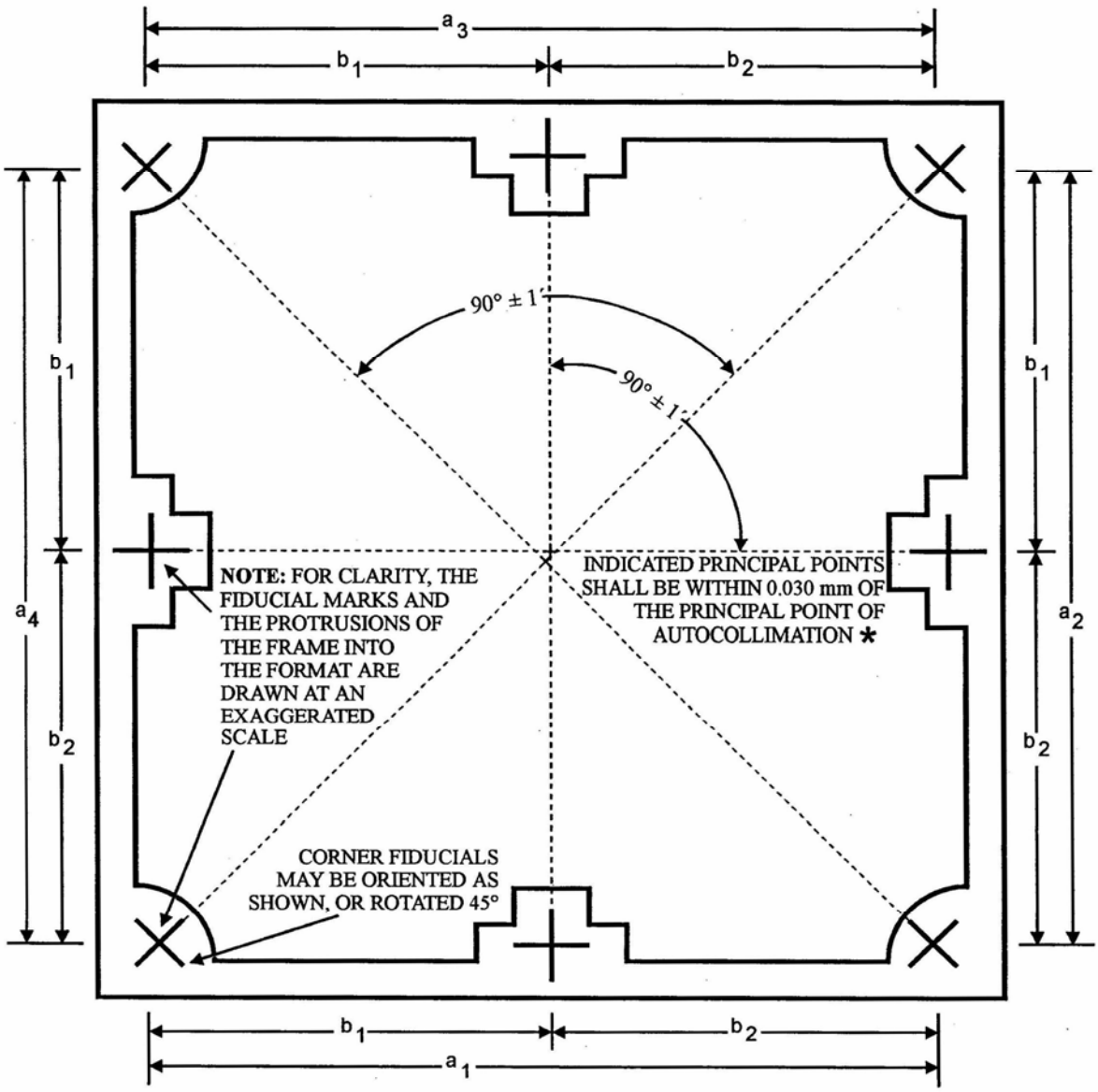


FIGURE 3
ARRANGEMENT OF FIDUCIAL MARKS



$a_1 = a_2 = a_3 = a_4$ (within 0.500 mm)

$b_1 = b_2$ (±0.500 mm)

* THE CALIBRATED PRINCIPAL POINT - THE POINT OF SYMMETRY - SHALL BE WITHIN 0.015 mm OF THE PRINCIPAL POINT OF AUTOCOLLIMATION FOR 153 mm LENSES AND 0.030 mm FOR ALL OTHER FOCAL LENGTH LENSES.

Table 1
USDA OPTICAL REQUIREMENTS

TABULATION OF OPTICAL REQUIREMENTS

Focal Length	88 mm	153 mm	210 mm	305 mm
Focal Length Within (mm)	± 4	± 3	± 4	± 5
Useable Angular Field	120°	90°	70°	50°
Field Angle-From Axis out to:	54.5°	40°	30°	22.7°
DISTORTION - At Maximum Aperture				
Radial Distortion - Tolerance (um)	± 15	± 10	± 20	± 20
Decentering Distortion - Tolerance (um)	-	< 8	-	-
MODEL FLATNESS - (um) Total Difference	± 17	± 19	-	-

INDICATED PRINCIPAL POINTS (Fiducial Centers)

The indicated principal points - fiducial centers - shall fall within a 0.040 mm radius circle around the principal point of autocollimation.

CALIBRATED PRINCIPAL POINT (Point of Symmetry)

The calibrated principal point - point of symmetry - shall fall within a 0.020 mm radius circle around the principal point of autocollimation for 153 mm focal length lenses and 0.040 mm for all others.

RESOLUTION
Measured on Spectroscopic Plate at Maximum Aperture

Minimum Radial & Tangential Resolution in Line Pairs per mm
LENS HALF ANGLE

Lens		0°	7.5°	15°	22.7°	30°	35°	40°	45°	50°	54.5°
86 mm	Wild Super Aviogon II Zeiss S-Pleogon A or equivalent	59	59	49	42	35	30	17	14	12	12
153 mm	Wild U. Aviogon Zeiss Pleogon A Jena Lamegon Pl or equivalent	57	57	48	48	40	34	14			
210 mm	Wild N-Aviogon II Zeiss Topargon or equivalent	49	49	42	35	29					
305 mm	Wild N. Aviotar Zeiss Topar or equivalent	48	48	28	24						

ATTACHMENT B

NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) SPECIFICATION FOR DIGITAL CAMERA BASED ACQUISITION

(Dated February 16, 2007)

1.0 INTRODUCTION AND BACKGROUND

The U.S. Federal Government has not yet established an independent government evaluation and calibration policy for digital camera systems since digital sensor technology is still rather new. Until a policy is developed and implemented, the U.S. Department of Agriculture (USDA), Farm Service Agency (FSA) has proceeded to validate the quality and capabilities of current digital camera systems by obtaining relevant information from camera manufacturers and data providers. The following specifications and requirements have been developed to ensure that any digital camera proposed for use on the NAIP contract meets minimum requirements to provide the highest quality orthoimagery products.

2.0 DIGITAL CAMERA SPECIFICATIONS AND REQUIREMENTS FOR NAIP

This document covers digital camera specifications and requirements for the USDA-FSA National Agriculture Imagery Program (NAIP). Acquisition of the digital imagery may be from airborne or space borne platforms. Digital cameras for acquiring precise vertical digital imagery are required to be tested and calibrated. Digital camera systems proposed for use must be of comparable precision and quality with traditional stereoscopic mapping cameras. Digital camera systems must also be compatible with analytical mensuration procedures used in photogrammetric surveys and in preparing accurate orthophotography. Only approved digital camera systems, which meet the requirements of these specifications as determined by appropriate camera system documentation and sample imagery submitted, shall be used.

3.0 GENERAL REQUIREMENTS

Digital cameras systems must be tested and calibrated with appropriate certification documentation. The digital camera must be geometrically stable and suitable for use in precise, high-accuracy photogrammetric orthoimagery applications. The digital camera system shall provide the following:

3.1 Ground Sample Distance

The camera shall provide the resolution and field of view necessary to meet the ground sample distance (GSD) requirement, as specified in Section B of the contract.

(a) For One-Meter GSD Imagery: Color interpretation or pan sharpening will be permitted to achieve the one-meter GSD requirements. The color bands (RGB) and near infrared (IR) bands may be collected at a ratio no greater than 1:5 to achieve the pan sharpened one-meter orthoimagery.

(b) For Two-Meter GSD Imagery: Color interpretation or pan sharpening will be permitted to achieve the two-meter GSD requirements. The color bands (RGB) and near infrared (IR) bands may be collected at a ratio no greater than 1:5 to achieve the pan sharpened two-meter orthoimagery.

3.2 Color Band and Depth.

The digital camera shall capture red, green, and blue channels (RGB) for natural color, and a near infrared channel(s) for color infrared (CIR) orthoimagery. The camera shall capture a minimum of 12-bits per color channel. All systems that use "pan-sharpened" algorithms shall have a color to panchromatic ratio not greater that 1.5.

3.3 Radiometric Accuracy

If more than one lens and more than one shutter are used in the camera system, the difference in radiometric values between two panchromatic or two multi-spectral sensors shall be less than ±5%. For example, a 12-bit image shall not have more than ±20 difference in gray values.

3.4 System Operation

The digital camera and its mount shall be checked for proper installation prior to each mission. An automatic exposure control device is permitted, but a manual override capability is required for some types of terrain to achieve proper coverage and exposure. The camera mount shall be regularly serviced and maintained and shall be insulated against aircraft vibration.

(a) Camera Port Glass. Aircraft camera port glass shall be preferably 50 mm thick, but not less than 32 mm thick. The surface finish shall be 80/50 or better. Glass material shall be polished crown, group category M, Mil Specs Mil-W 1366F (ASG), dated October 1975, C-1 optical quality or better.

(b) Malfunctions. The contracting officer shall be notified of all digital camera system malfunctions within 72 hours with a written report of the malfunction. A malfunction is defined as a failure in any element or process of the digital camera system that causes an interruption of the normal operations of the system. Any malfunctions or failures of global positioning systems or inertial measurement unit systems shall be reported directly to the contracting officer.

3.5 Calibration Reports

Calibration reports for each digital camera proposed for use shall be submitted to the contracting officer with the contractor's proposal and prior to project imagery

acquisition if the digital camera system is removed and remounted. The contractor shall follow manufacturer's specifications for appropriate calibration and recalibration. The calibration reports shall address the geometric performance of the system, and at a minimum, include:

(a) Date of report
(b) The name of the person or company performing the calibration
(c) The methodology and procedures used for calibration
(d) Final calibration parameters, such as calibrated focal length, lens distortion values, radiometric calibration parameters, and principal point location.

NOTE: The government recognizes that individual calibration reports, procedures, and parameters may be unique to a certain manufacturer since equipment and systems vary from manufacturer to manufacturer.

3.6 System Maintenance

The contractor shall perform all maintenance in accordance with the manufacturers recommended and established procedures. The contractor shall maintain a complete history of all maintenance done to the digital camera system and have it available for Government inspection. The contractor shall provide certification that the system has been maintained, preventive maintenance and calibration performed, to the manufacturers requirements.

4.0 DIGITAL CAMERA APPROVAL REQUIREMENTS

All digital camera systems must be approved by the Contracting Officer before acquiring imagery under this contract. When requesting approval, the Contractor shall submit, or have on file with APFO, a report of calibration (see Paragraph 2.3), sample digital imagery (see Paragraph 4.1), and camera documentation (see Paragraph 4.2). Sample imagery must be at the same scale and resolution of the project that the Contractor is requesting approval for. It is highly recommended that the sample imagery include agriculture areas.

4.1 Digital Camera Sample Imagery Requirements

The contractor shall acquire and submit with their proposal, sample images from the digital camera proposed for use. The sample imagery shall represent the type of terrain (agriculture, cropland, forest, etc.) that is similar to the proposed project item area being offered. (See Section L-2 of the contract).

The digital camera sample imagery shall provide the following minimum characteristics:

(a) Display the same GSD resolution being offered as indicated in Section B.
(b) For natural color proposals (RGB bands), the sample image shall be 24 bits in color depth. It may be collected at 12 bits per color band, but be re-sampled to 8 bits per band for sample image delivery.

(c) For color infrared proposals (G,R,IR bands), the sample image shall be 24 bits in color depth. It may be collected at 12 bits per color band, but be re-sampled to 8 bits per band for sample image delivery.
(d) Sample image shall be ortho-rectified, with geodetic standards of North American Datum 1983 (NAD83) and UTM projection with the appropriate Zone indicated.
(e) Sample shall be produced as a DOQQ formatted, GeoTIFF image using the standard indicated in Section C-6.2 of the contract.
(f) The sample imagery shall fit on one standard CD, formatted as described in Section D-1.2 of the contract.

4.2 Digital Camera Documentation Requirements

The contractor shall provide with their proposal detailed documentation of the digital camera proposed for use. Documentation may include brochures, technical specifications, marketing material, manufacturer's user manuals, or other descriptive literature. The documentation shall contain at a minimum the following information:

(a) General overview information
(b) Product configuration description
(c) Camera component description
(d) Technical specifications
(e) Computer management and storage systems
(f) Image acquisition and processing workflow.

4.3 Multiple Camera Approval

The use of more than one type of digital camera system (i.e.: DMC, ADS40, UltraCam) in the acquisition of the same project item area requires submittal of sample imagery and approval by the contracting officer. The contractor must submit sample imagery with appropriate documentation that demonstrates successful mixing or blending of two different camera systems without offsets, obvious seam lines, or other apparent defects. The contractor's sample imagery of "mixed" camera systems shall be provided in accordance with the image characteristics as specified in Paragraph 4.1 above. Sample imagery may be submitted as part of the contractor's proposal and must meet all accuracy and quality requirements and specifications of this contract.

5.0 PROJECT DATA FILES

5.1 Photo-Center Data File. A photo-center data file shall be created with the minimum attributes:

DESCRIPTION	MAXIMUM NUMBER OF CHARACTERS IN FIELD
Project Code (NAIP<YY>)	6
Line Number	5*
Exposure Number	3
Date of Exposure (YYYYMMDD)	8
Sensor Serial Number	10

Latitude (DD.DDDDD)	8
Longitude (- DDD.DDDDD (Negative))	10
Flight Altitude in meters at camera (MMMMM.MM; AGL)	8

* Line number should be padded with leading zeros.

Example:
NAIP07,00001,222,20040721,12345678,42.71936, -123.41498, 07048.63

USDA
DIGITIAL ORTHOIMAGERY QUARTER QUADRANGLE (DOQQ) DESCRIPTION AND SPECIFICATION

16 Feb 2007

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(801) 975-3500

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1.0 SCOPE

This document establishes the technical criteria to be used in the production of digital orthoimagery quarter quadrangles (DOQQs) for all contracts issued by the Aerial Photography Field Office. The standard DOQQ format is a 3.75-minute by 3.75-minute[1] quarter-quadrangle natural color or color near-infrared (CIR) image[2].

2.0 APPLICABLE DOCUMENTS

In the event of conflict between the contents of this specification and the documents referenced herein, the contents of this specification shall take precedence.

2.1 TIFF Specification Revision, 6 dated June 3, 1992 (Adobe Systems Inc.). The Tagged Image File Format (TIFF) is a copyrighted standard of Adobe Systems, Inc.

2.2 GeoTIFF Revision 1.0 Specification, dated December 28, 2000 (Version 1.8.2). The GeoTIFF Format Specification is a public domain extension of TIFF that provides a robust and flexible method of storing georeferencing information in a TIFF file.

3.0 GENERAL REQUIREMENTS

United States Department of Agriculture (USDA) programs use DOQQs for various program uses including, but not limited to agriculture land use analysis, natural resource inventory, and extraction of data by means of photogrammetric measurements. The complex nature and the need for consistent but radiometric correct imagery require DOQQs to adhere to exact format and content of this specification.

3.1 General.

(a) Geographic Extent. Each DOQQ shall cover the entire image area of one standard USGS quarter quadrangle with a minimum 300 (±30) meter buffer on all four sides. Extents shall be computed by projecting the geographic corners and side midpoints to the appropriate projection, then adding the buffer on each side of the resulting minimum bounding rectangle.

(b) Non-image data. DOQQs shall not contain any non-image data. Non-image data includes photographic frame borders, fiducal marks, artifacts, and titling. Non-image data also includes “fill” induced by a lack of elevation surface model coverage that results in white, black, or spurious intensity values.

[1] The 3.75-minute by 3.75-minute quarter-quadrangle is only standard in continental United States. The size of Alaska quarter-quadrangles will vary with the latitude.

[2] A combined natural color and CIR image (commonly called a 4-band) is also required to meet all requirements state herein (See paragraph X.X).

(c) Datums and Coordinates. All DOQQs shall be projected in the North American Datum of 1983 (NAD83), using the corresponding native Universal Transverse Mercator (UTM) zone (see Figure 1, UTM Zones) with coordinates in meters. The vertical datum for all DOQQs shall be North American Vertical Datum of 1988 (NAVD88). The latest datum version shall be used.

(d) Image Mosaicking. DOQQs may be created using multiple digital images ("chips") to produce the final product. Specular reflections in DOQQs should be minimized, especially in agriculture areas, by patching the area using chips from other imagery.

(1) Radiometry Balance. When a mosaic of two or more chips is made, the brightness and color values of the other chips will be adjusted to match that of the principal chip. The join lines between the overlapping chips will be chosen to minimize tonal variations. Localized adjustment of the brightness and color values will be done to reduce radiometric differences between join areas.

(2) Edge-Matching. All chips shall not have more than ±3 pixels offset between the principal chip.

3.2 Image Quality. All digital images shall have proper histograms and tone balance. Color imagery shall also have proper color balance and saturation.

(a) Clipping. The DOQQs shall have a tonal range that prevents the clipping of highlight or shadow detail from the image. When calculated against the luminosity histogram, the cumulative pixel count between the first and last five histogram bin values (5 and 250 respectively for 8-bit depth) shall not be less than 98.0%, with a preferred value greater than 99%.

(b) Contrast. When calculated against the luminosity histogram, the difference between the histogram bin value that contains 99.0% of the cumulative pixel count and the value that contains 1.0% shall be greater than 120, with a preferred value of greater than 150. If the cumulative pixel count percentage falls between two histogram bin values, the close value shall be used. For example, if the luminosity value 222 contains 99% of the cumulative pixel count and value 44 contains 1% count, therefore the difference is 178.

(c) Histogram Peak. All DOQQs shall have a pixel count peak within ±15% of the middle digital value allowed for the bit depth. For example, an 8-bit depth image must have the histogram peak between 108 and 148.

(d) Color Balance. All DOQQs should have a neutral tonal range without the dominance of any individual color. The difference between the minimum and maximum value in a RBG triplet of any nearly neutral objects within the image shall be less than 10, with a preferred value greater than 5.

(e) Band-to-Band Registration Accuracy. Misregistration between any color bands shall not exceed 1 pixel.

(f) Image blemishes, scratches and artifacts. Imagery shall be free of blemishes, scratches, and artifacts that obscure ground feature detail. The following table defines the maximum acceptable limits for blemishes, scratches, and artifacts. Clusters of blemishes, scratches, and artifacts that do not individually meet these criteria may be considered unacceptable.

Acceptable Image blemishes, scratches and artifacts	
1 pixel wide	100 pixels in length
2 pixels wide	60 pixels in length
3 pixels wide	20 pixels in length
4 – 12 pixels wide	12 pixels in length

3.3 Radiometic Resolution.

(a) Black & White Imagery. All B&W imagery shall be an 8-bit grayscale image in accordance with Section 4, Grayscale Images, of the TIFF Specification.

(b) Color Imagery. All color imagery shall be an 8-bit RGB image in accordance with Section 6, RGB Full Color Images, of the TIFF Specification. Both natural color and near-infrared color are considered to be color imagery.

(c) 4-Band Imagery. All imagery that contains both natural color and CIR shall meet the same requirements as color imagery specified in the paragraph above and shall have the samples saved in the following order:

3.4 Spatial Resolution. The spatial resolution will be either 1-meter or 2-meter ground sample distance (GSD), depending on USDA's requirements. DOQQs produced under this specification shall not be resampled from the original image, original scan or original capture, with resolution greater or less than the following numbers:

Ground Sample Distance (GSD)	**Original Image Resolution**	
	Maximum (meters)	**Minimum (meters)**
1-meter	0.50	1.05
2-meter	1.00	2.10

3.5 Horizontal Accuracy. All DOQQs shall have 95% of all well-defined points tested fall within the specified distance listed below of true ground.

Ground Sample Distance (GSD)	Horizontal Accuracy (meters)
1-meter	6.0
2-meter	10.0

3.6 Digital Image File Format. All DOQQs shall be produced using a georeferenced tagged image format (GeoTIFF) in accordance with this specification, the GeoTIFF 1.0 Specification, and the baseline TIFF 6.0 Specification (stated in order of precedent). All DOQQs shall be readable by older applications that assume TIFF 5.0 or an earlier version of the specification. List 1, Tag Listings, List 2, "tiffinfo" Output, and List 3, ListGeo Output shows an example of a TIFF tag listing.

DOQQs that use designated "Extended TIFF 6.0 file" features, as defined in Section 2 of the TIFF Specification, shall not be used. This includes, but not limited to, any of the major new extensions such as "tiled images." Features designated as "not recommended for general data interchange" are considered extensions to the baseline TIFF 6.0 specification and shall not be used.

(a) Tagged Image File Format (TIFF) Requirements

(1) All public tags shall confirm to the TIFF Specification and shall not be modified outside of the parameters given in the specification. Use of tag numbers not specified in the TIFF Specification for either Grayscale or RGB full color images, depending on color band of the DOQQ, is not permitted. As a minimum, the TIFF tags listed in Table 1, Required TIFF Tags, and Table 2, Required GeoTIFF Specific Tags, shall be included when creating DOQQs under this specification.

(2) Tags numbered 32,768 or higher, sometimes called private tags, are reserved and shall not be used unless listed in Table 3, Approved Private Tags. Enumeration constants numbered 32,768 or higher are reserved and shall not be used.

(3) Tags numbered in the "reusable" 65,000-65,535 range shall not be used.

(4) All DOQQ files shall be created using the little-endian byte order as specified in the TIFF Specification. Bytes 0-1 of the Image File Header must be "II" (4949.H).

(5) All DOQQ files shall only have a single Image File Directory (IFD).

(6) Tiled TIFF files are not allowed.

(b) Georeferenced Tagged Image Format (GeoTIFF) Requirements. A GeoTIFF file is a TIFF 6.0 file, and inherits the file structure as described in the

corresponding portion of the TIFF Specification. All GeoTIFF specific information is encoded in several additional reserved TIFF tags, and contains no private Image File Directories (IFD's), binary structures or other private information invisible to standard TIFF readers.

The GeoTIFF 1.0 standard uses a MetaTag (GeoKey) approach to encode dozens of data elements into just six TIFF 6.0 tags. GeoKeys are structurally similar to TIFF 6.0 tags, but at one lower level of abstraction. As a minimum, the four tags listed in Table 3, Required GeoTIFF MetaTags, shall be included when creating DOQQs under this specification.

4. VERIFICATION

Any DOQQs not meeting the requirement in Section 3 may be rejected for non-compliance. Each DOQQ or, at the APFO's determination, a random sample from the lot may be inspected using the following methods. The use of automated processes, such as computer scripts, may be substituted for visual verification.

4.1 General.

(a) Geographic Extent. Visual verification will be done to verify DOQQ coverage.

(b) Non-image items. Visual verification will be done to ensure DOQQs do not contain any non-image.

(c) Datums and Coordinates. Verification of georeferencing, correct datums and coordinate systems, by shall be accomplished by visually viewing the image using GIS software other than the software used to create the image.

(d) Image Mosaicking. Visual verification will be done to verify tonal and brightness values across chips used to create the DOQQ and to verify edge-matching against adjacent tiles.

4.2 Image Quality.

(a) Clipping. Visual or automated verification on the luminosity histogram will be done to verify overall clipping.

(b) Contrast. Visual or automated verification on the luminosity histogram will be done to verify image contrast range.

(c) Histogram Peak. Visual or automated verification on the luminosity histogram will be done to verify peak histogram value.

(d) Color Balance. Visual or automated verification on the luminosity histogram will be done to verify overall clipping. Visual verification will be done to each DOQQto verify proper histogram and tone balance.

(e) Band-to-Band Registration Accuracy. Visual verification on the luminosity histogram will be done to verify band-to-band registration.

(f) Image blemishes, scratches and artifacts. Visual verification on the luminosity histogram will be done to verify that the image does not contain artifacts.

4.3 Radiometic Resolution. Visual verification will be done to verify bit depth and compliance with TIFF Specification.

4.4 Spatial Resolution. Visual verification will be done to measure spatial resolution.

4.5 Horizontal Accuracy. Visual verification will be done to verify DOQQ horizontal accuracy. This may include measurements compared against existing control imagery or other means at the disposal of USDA.

4.6 Digital Image File Format. Automated computer scripts will be used to verify that all GeoTIFF and TIFF Specifications are complied with. Correct encoding of all required Meta-Keys (also called GeoKeys) shall be confirmed by referencing each GeoKey using a software application designed to check each against the specifications.

5.0 NOTES

5.1 DEFINITIONS

Band – a range of wavelengths of electromagnetic radiation. Also, image data gathered at this wavelength range.

Brightness value – a number (normally 0-255) representing a discrete intensity gray level of a pixel in an image.

Chip – each separate piece of a mosaick image that contributes to the final image.

Clipping – The presence of pixels exhibiting the minimum or maximum digital count in an image's dynamic range.

Dodging – manipulation of the intensity of part if a photograph by selectively shading or masking.

Field – refers only to the entire field, including the value, of the geokey (as defined in the TIFF Specification).

Ground Sample Distance (GSD) – the area of ground represented in each pixel in x and y components.

Image File Directory – contains information about the image. There must be at least 1 IFD in a TIFF file and each IFD must have at least one entry.

Metadata – description of the content, quality, condition, and other characteristics of the data.

Private tags – TIFF tags numbered 32768 or higher. Private tags are not defined in the TIFF Specification.

Public tags – TIFF tags that are defined by the TIFF Specification.

Resample – interpolation of pixel values based upon neighboring pixel values.

Tag – refers only to the identifying number portion of the geokey (as defined in the TIFF Specification).

Figure 1, UTM Zones

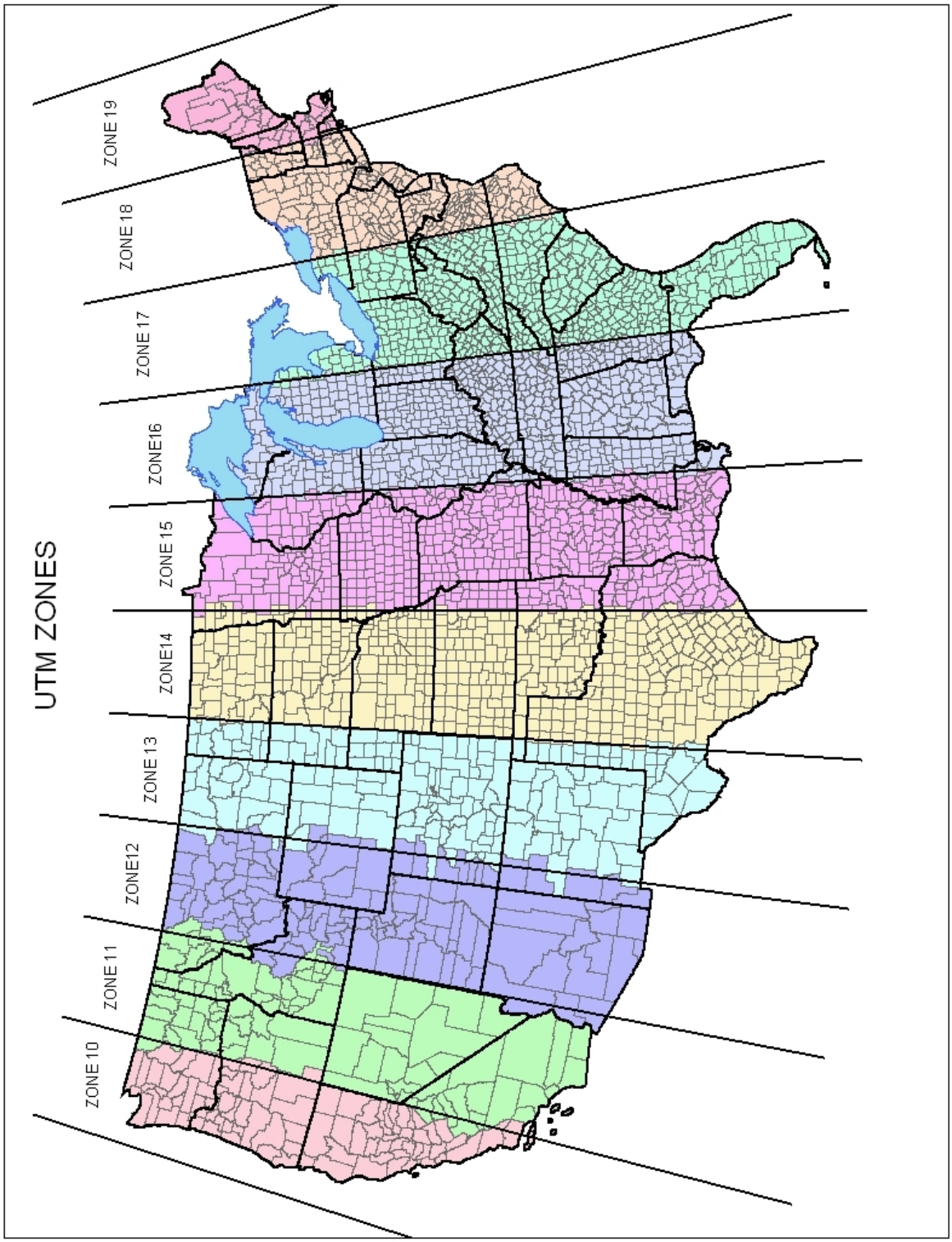

Table 1, Required TIFF Tags

TAG NAME	DESCRIPTION
ImageDescription tag (270.d, 10e.h)	The ImageDescription tag shall contain the program name. For example, under the NAIP contract the tag willread: "USDA-FSA-APFO National Agriculture Image Program"
DocumentName tag (269.d, 10d.h)	The DocumentName tag shall have the following form: <Quad Name> <Quadrant> <Quad id> where: <Quad Name> is the name of the quadrangle taken from the provided list of quarter quadrangles for a county. <Quadrant> Is the quadrant identifier for a quadrangle. <Quad id> is the "Usgsqdno" field taken from the provided list of quarter quadrangles for a county

Table 2, Required GeoTIFF Specific Tags

TAG NAME	DESCRIPTION
ModelPixelScaleTag (33550.d, 830e.h)	The X and Y values must be populated and be equal to the ground distance of one DOQQ pixel.
ModelTiepointTag (33922.d, 8482.h)	This tag specifies the (X,Y) ground coordinates of the (0,0) image pixel, by convention in the upper left corner of the image. All DOQQs shall use the UTM project reference frame. GeoTIFF 1.0 allows considerable flexibility in how an image is tied to the ground, but DOQQ image data should be tied to the (0,0) pixel. The Z coordinate value should be set to 0. See section 2.6.1 of the GeoTIFF 1.0 standard.
GeoAsciiParamsTag (34737.d, 87b1.h) (required)	This tag is used to store all the ASCII-valued GeoKeys. See section 2.4 of the GeoTIFF 1.0 standard.
GeoKeyDirectoryTag (34735.d, 87af.h) (required)	This tag references all non-ASCII GeoKeys. All projection and datum information is stored in GeoKeys. See section 2.10.2.2 of this standard and section 2.4 of the GeoTIFF 1.0 standard.

Table 3, Approved Private Tags

TAG NAME	ID
ModelPixelScaleTag	33550 (SoftDesk)
ModelTransformationTag	34264 (JPL Carto Group)
INGR Packet Data Tag	33918 (Intergraph)
INCR Flag Registers	33919 (Intergraph)
IrasB Transformation Matrix	33920 (Intergraph)
UnUsed	33921 (Intergraph)
ModelTiepointTag	33922 (Intergraph)
GeoKeyDirectoryTag	34735 (SPOT)
GeoDoubleParamsTag	34736 (SPOT)
GeoAsciiParamsTag	34737 (SPOT)

Table 3, Required GeoTIFF MetaTags

TAG NAME	DESCRIPTION
GTModelTypeGeoKey (1024.d, 400.h) (required)	The required value is 1 (ModelTypeProjected).
GTRasterTypeGeoKey (1025.d, 401.h) (required)	a. The required value is 1 (RasterPixelIsArea) which is the default value. b. The "PixelIsArea" raster grid space uses coordinates I and J, with (0,0) denoting the upper-left corner of the image, and increasing I to the right, increasing J down. The first pixel-value fills the square grid cell with the bounds top-left = (0,0), bottom-right = (1,1) and so on; by extension this one-by-one grid cell is also referred to as a pixel. An N by M pixel image covers an area with the mathematically defined bounds (0,0),(N,M). c. This raster space designates the upper-left corner of an image. The coordinate pair values for this location shall be “a whole number of pixels.” Each value “must be integer multiple of the resolution” of the DOQQ image. For a 1-meter resolution image this pair can be odd or even whole numbers, for a 2-meter resolution image this pair needs to even whole numbers. d. The desired result is to have “Exact Pixel Registration,” meaning that pixels from multiple images line up exactly. This should not be confused with overlaps or gaps, but the cells have to fall on an even multiple of the cell width and height from one another, and adjacent images cannot have cells starting halfway, or partially into the cells of the original image

ProjectedCSTypeGeoKey (3072.d, c00.h) (required)	This key contains a coded value for the projection, datum, and possibly plane coordinate zone. Legal values for this key are listed in section 6.3.3.1 of the GeoTIFF 1.0 standard.
PCSCitationGeoKey (3073.d, c01.h) (required)	This is a free text field for describing the projection and datum. DOQQ images are projected into the UTM coordinate system. These fields shall describe the projection, zone, and datum and shall be in the following form: a. <datum>/UTM Zone <number> <N/S> (i) <datum> is the common datum abbreviation, NAD83. (ii) Where <number> is the UTM zone number. b. Example: NAD83 / UTM zone 15N
GTCitationGeoKey (1026.d, 402.h) (required)	This is a free text field for providing a description of the DOQQ. The GeoKey contents shall be in the following form. a. <program> <year> <n>_<lat><lon><quad>_<loc>_ <xx>_<r>_<yyyymmdd> program – Program Name (i.e., NAIP). year - Program year (i.e., 2005). n – Film type (n=natural color or c=color infra red) lat – Latitude, identified by 2 digit numerical value of a 1º block (including the leading “0” if needed). lon – Longitude, identified by 3 digit numerical value of a 1º block (including the leading “0” if needed). quad – Quadrangle location, identified by a 2 digit numerical value to identify the position in a one degree block. loc – Quarter quadrangle location, identified by grid letters (nw,ne,sw,se). xx – Two digit UTM zone. r – Image resolution (1 = 1-meter; 2 = 2-meter). yyyymmdd – date of acquisition. b. Example: NAIP 2005 n_3309403_nw_15_2_20050714
ProjLinearUnitsGeoKey (3076.d, c04.h) (required)	This key contains a coded value for the linear units used by the projection. Legal values for this key are listed in section 6.3.3.1 of the GeoTIFF 1.0 standard. DOQQs shall use the code value of 9001 (“Linear_Meter”).

List 1, Tag Listings

The following table summarizes the TIFF 6.0, GeoTIFF 1.0, and GeoKey requirements. The values in the table are consistent with the TIFF 6.0 and GeoTIFF 1.0 standards, but there are less options than are allowed by TIFF. Additional guidelines and requirements for the values of tags and keys are detailed in the body of this standard. Additional public tags and keys may be used at the data producer's option, providing they do not conflict with the required tags.

TIFF tags required by baseline TIFF:

TagName	Decimal	Hex	Type	Value
ImageWidth	256	100	SHORT or LONG	
ImageLength	257	101	SHORT or LONG	
BitsPerSample	258	102	SHORT	8,8,8
Compression	259	103	SHORT	1
PhotometricInterpretation	262	106	SHORT	2
Orientation	274	112	SHORT	1
StripOffsets	273	111	SHORT or LONG	
SamplesPerPixel	277	115	SHORT or LONG	3
RowsPerStrip	278	116	SHORT or LONG	1
StripByteCounts	279	117	LONG or SHORT	

TIFF tags defined by GeoTIFF:

TagName	Decimal	Hex	Type	Value
ModelPixelScaleTag	33550	830E	DOUBLE	
ModelTiepointTag	33922	8482	DOUBLE	
GeoAsciiParamsTag	34737	87B1	ASCII	
GeoKeyDirectoryTag	34735	87AF	SHORT	

GeoKeys defined by GeoTIFF and used by APFO:

TagName	Decimal	Hex	Type	Value
GTModelTypeGeoKey	1024	400	6.3.1.1 code	1
GTRasterTypeGeoKey	1025	401	6.3.1.2 code	1
GTCitationGeoKey		1026	402	ASCII
ProjectedCSTypeGeoKey	3072	C00	6.3.3.1 code	
PCSCitationGeoKey	3073	C01	ASCII	
ProjLinearUnitsGeoKey	3076	C04	SHORT	

List 2, "tiffinfo" Output

This listing is an output of the libtiff utility program "tiffinfo".

```
TIFF Directory at offset 0x2370bc4
  Image Width: 3247 Image Length: 3815
  Resolution: 200, 200 (unitless)
  Bits/Sample: 8
  Compression Scheme: none
  Photometric Interpretation: RGB color
  Document Name: "Garvin NE 3309401:
  Image Description: "USDA-FSA-APFO National Agriculture Imagery Program"
  Samples/Pixel: 3
  Rows/Strip: 1
  Planar Configuration: single image plane
```

List 3, ListGeo Output

The following is an example of a GeoTIFF tag and GeoKey listing from a NAIP image. This listing is the output of the libgeotiff utility program "listgeo". The projection information below the line "End_Of_Geotiff" is implied by the standard projection and is not stored explicitly in the data file. The descriptions are retrieved from libgeotiff lookup tables in the listgeo application.

```
Geotiff_Information:
   Version: 1
   Key_Revision: 1.0
   Tagged_Information:
      ModelTiepointTag (2,3):
         0          0          0
         337962     3763838    0
      ModelPixelScaleTag (1,3):
         2          2          1
      End_Of_Tags.
   Keyed_Information:
      GTModelTypeGeoKey (Short,1): ModelTypeProjected
      GTRasterTypeGeoKey (Short,1): RasterPixelIsArea
      GTCitationGeoKey (Ascii,45): "2004 NAIP n_3309403_nw_15_2_20050714"
      ProjectedCSTypeGeoKey (Short,1): PCS_NAD83_UTM_zone_15N
      PCSCitationGeoKey (Ascii,21): "NAD83 / UTM zone 15N"
      ProjLinearUnitsGeoKey (Short,1): Linear_Meter
      End_Of_Keys.
   End_Of_Geotiff.
```

PCS = 26915 (name unknown)

Projection = 16015 ()
Projection Method: CT_TransverseMercator
  ProjNatOriginLatGeoKey: 0.000000 (0d 0' 0.00"N)
  ProjNatOriginLongGeoKey: -93.000000 (93d 0' 0.00"W)
  ProjScaleAtNatOriginGeoKey: 0.999600
  ProjFalseEastingGeoKey: 500000.000000
  ProjFalseNorthingGeoKey: 0.000000
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: 9001/metre (1.000000m)

Corner Coordinates:
Upper Left (337962.000,3763838.000) (94d45'16.56"W, 34d 0' 9.55"N)
Lower Left (337962.000,3756208.000) (94d45'11.47"W, 33d56' 1.94"N)
Upper Right (344456.000,3763838.000) (94d41' 3.51"W, 34d 0'13.09"N)
Lower Right (344456.000,3756208.000) (94d40'58.63"W, 33d56' 5.47"N)
Center (341209.000,3760023.000) (94d43' 7.54"W, 33d58' 7.53"N)