

Request for Proposals for Aerial Mapping Services

MMAGIC

September 2025

Table of Contents

Project Timeline / Contact.....	3
Project Description.....	4
Selection Criteria	4
Proposal Format.....	5
Submission of Proposals	6
Right of Refusal	6
Proposal Condition	6
Open Record and Proprietary Information	8
Contract Period	8
Compensation	9
Confidential Matters and Data	9
Indemnification and Insurance	9
Bond Requirements.....	9
Legal Notice.....	10
Scope of Work	11
Map of Project Area.....	Supplement "A"

The proposed timeline of this project is:

September 17, 2025 Announce RFPs
September 17 2025 - December 1, 2025 Respond to prospective bidder questions
December 1, 2025 Receive proposals for review (**4:30PM EST deadline**)
No later than January 1, 2026 Review the proposals and select vendor
No later than March 13, 2026 Aerial photography capture process
No later than March 13, 2026 Confirmation of Imagery Flight Dates
March 27, 2026 Imagery Status Update
April 10, 2026 Imagery Processing Status Update
April 24, 2026 Imagery Processing Status Update
May 8, 2026 Imagery Processing Status Update
May 22, 2026 Imagery Processing Status Update
June 1, 2026 Receive project deliverables

Any questions regarding this document will be submitted in writing to Cal Carlson, Monongalia County GIS Coordinator, by December 1, 2025. Any questions of a substantive nature will be answered in written form and emailed to all Vendors.

Cal Carlson

Phone: (304) 413-0291

GIS Coordinator, Monongalia County

Email: gis@monongaliacounty.gov

243 High Street, Rm 335

Morgantown, WV 26505

Project Description

MMAGIC is requesting proposals from professional aerial photography Vendors for the spring of 2026 leaf-off aerial flights and natural color digital photography. This imagery will be rectified to the NAD 1983 West Virginia North State Plane Coordinates with a unit of measurement of US Survey Foot.

The Monongalia-Morgantown Area Geospatial Information Consortium (Hereafter MMAGIC) is a multi-agency partnership created to build, maintain, and cross-share data within a Geographic Information System within Monongalia County, WV. Monongalia County is situated in the northcentral portion of West Virginia. Monongalia County has a population of over 100,000 and is home to West Virginia University and has an area of over 366 square miles. The largest city within the County and the County seat is the city of Morgantown. The aerial update will be comprised of approximately 366 square miles that includes the majority of Monongalia County as well as portions outside of the County to provide adjacent coverage for natural and man-made features of interest. A map depicting the area can be found in Supplement "A."

Selection Criteria

The successful Vendor will be picked by a selection committee made up of the Chair of MMAGIC and a group of his choosing. This group will open the proposals after the deadline date and time to review for selection. This group will meet after the deadline for submissions to review the proposals based on the firm being able to provide a cost- effective quality product evidenced by:

- Company background and history.
- Resumes for lead staff that will work on the project.
- Relevant experiences with comparable projects covering similar geographic extents and landform.
- Client references (At least 3).
- Adequacy of resources.
- Ability to meet scheduled completion dates.
- Understanding of project milestones.
- Use of modern technology.
- Project management plan incorporated in the response.
- Quality control procedures.

- Satisfactory relationship with the MMAGIC based on prior work, if any.
- Price.
- Project deliverables.

MMAGIC will conduct a preliminary evaluation of all proposals based on the information provided with the proposal, the ability of the Vendor to perform, their past performance, their apparent understanding of the work to be performed, and the needs of MMAGIC. MMAGIC will select the proposal that is deemed to be the best overall value to MMAGIC, taking into consideration both cost and technical capability.

Those submitting a proposal do so entirely at their expense. There is no express or implied obligation by MMAGIC to reimburse any individual or firm for any cost incurred in preparing or submitting proposals, providing additional information when requested by MMAGIC, or for participating in any selection interviews.

No negotiations, decisions, or actions will be initiated by any firm as a result of any verbal discussion with any MMAGIC representative prior to MMAGIC's award, if any, in response to the Request for Proposal. MMAGIC reserves the sole discretion to select the service(s) and/or provider(s), and subsequently to make an award, if any, based upon the proposed services which MMAGIC believes best meet MMAGIC's needs, budget constraints, quality levels, and expectations.

Proposal Format

- Executive Summary - A brief non-technical explanation of the project and the company's ability to adhere to the requirements.
- Company Background - A description of the Vendor's business past, company size, and length of time in delivering this kind of service. Resumes of personnel that will be working on this project should be included in this space.
- Project Plan - The Vendor will outline their plan of action to provide the required services as included in the section of this document title "Scope of Work." In addition to providing narrative on the items in the scope of work, the Vendor may also provide other information and possible deliverables for review. The Vendor will also include a project timeline for the successful completion of the project.
- References - The Vendor shall provide at least three references that reflect a similar scale of nature, size, and complexity described in this RFP.
- Contract Terms/Conditions - This section will be where the Vendor will include their sample agreements and requirements.

- Pricing - All costs must be itemized and included in this section and shall be stated in exact amounts. If additional deliverables are included beyond those specified in the Scope of Work (Oblique imagery, LiDAR, etc.), itemize their costs as well in exact amounts.

Submission of Proposals

Each Vendor must submit 10 copies in a sealed envelope/container bearing on the outside the name of the firm, full address, RFP # for which the proposal is submitted, and date and time proposal is due. Proposal responses should be addressed to:

Monongalia County Assessor's Office
243 High St, Rm 335
Morgantown, WV 26505 Attn: 2026 Aerial Update RFP

Proposal responses must be received no later than Monday, December 1, 2025 at 4:30 p.m. (EST)

Late proposal responses will not be considered for contract award and will be returned to the proposer.

Right of Refusal

MMAGIC reserves the right to refuse or reject any proposal wholly or partly which in MMAGIC's sole discretion best serves its interest, to waive minor defects or technicalities, or to solicit new proposals on the same project or on a modified project which may include portions of the originally proposed project as MMAGIC may deem necessary or in its best interest. This includes the right of MMAGIC to negotiate on any portion of a proposal. Acceptance of any Vendor's response does not place MMAGIC under any obligation to enter into a contract with a Vendor. Bids received after the specified deadline will be returned unopened.

Proposal Conditions

In submitting a response to this Request for Proposals, Vendor represents they understand the following:

- Alternate proposals (two or more proposals submitted) will be considered for an award. MMAGIC reserves the right to make the final determination of actual equivalency or suitability of such proposals with respect to requirements outlined herein.
- MMAGIC will retain the right to reject any part of or any and/or all proposals received, or to accept any item or items in the proposal, if determined to be non-responsive in any form, or if determined to be in the best interest of MMAGIC. It will further be understood that each Vendor's sureties and insurers are subject to the approval of MMAGIC.

- MMAGIC may award a contract, based on initial offers received, without discussion of such offers.

A Vendor's initial offer should therefore be based on the most favorable terms available from a price and technical standpoint. MMAGIC may, however, discuss with those Vendors it deems in its discretion to fall within a competitive range. MMAGIC may also request best and final offers from any Vendor and thereafter make an award or conduct negotiations.

- MMAGIC reserves the right to negotiate separately with any Vendor after opening of the Proposals when it determines such action is in MMAGIC's best interest. Subsequent negotiations may be conducted, but such negotiations will not constitute acceptance, rejection, or counteroffers on the part of MMAGIC.
- Prices proposed may not be withdrawn for a period of 120 days following the opening of the *Proposals*. Prices MUST also be free of duties, federal, state, and local taxes unless otherwise imposed by a governmental body.
- Vendors MUST return ten (10) completed copies of this document to Monongalia Assessor's Office, 243 High St, Rm 335, Morgantown, West Virginia, 26505, on or before 4:30 p.m. on the proposal due date.
- Envelopes/container containing Responses must be sealed and marked on the lower left-hand corner with the firm name and address, proposal number, proposal due date, and proposal opening time.
- MMAGIC interprets the term "lowest responsive bidder/vendor" as requiring MMAGIC to: (a) choose between the kinds of materials, goods, wares, or services subject to the proposal, and (b) determine which proposal is most suitable for MMAGIC's intended use or purpose. MMAGIC can consider, among other factors, such as labor cost, service, and costs of service upon which proposals are received. MMAGIC can determine any differences or variations in the quality or character of the services performed or provided by the respective Vendors.
- All requested information must be supplied. If you cannot respond to any part of this request, state the reason you cannot respond. You may provide supplemental information, if necessary, to assist MMAGIC in analyzing your proposal.
- A contractual agreement represents MMAGIC's offer to that proposed Vendor upon the terms and conditions stated herein, and will become binding meeting the terms set forth

herein when it is accepted by acknowledgment or performance.

- After the award, if the successful Vendor refuses or fails to make delivery of the services within the times specified in the *Request for Proposals*, or contractual agreement, MMAGIC may, by written notice, terminate the contract.
- The Vendor to this Request for Proposals promises to furnish all labor, supplies, equipment and incidentals necessary to provide the services described herein in accordance with the Request for Proposal, Addenda, Contract, Bonds, Insurance, Plans, Specifications, Requirements and Conditions.
- If a response to this Request for Proposals is accepted, the Vendor agrees to execute and deliver to MMAGIC a contract in accordance with the Contract Documents within ten days of notice of the award to Vendor.
- The Vendor hereby certifies he or she has carefully examined all the documents for the project, has carefully and thoroughly reviewed this Request for Proposals, understands the nature and scope of the work to be done; and this proposal is based upon the terms, specifications, requirements, and conditions of the Request for Proposals and any associated documents. The Vendor further agrees that the performance time specified is a reasonable time, having carefully considered the nature and scope of the project as aforesaid.
- MMAGIC reserves the right to cancel the work described herein prior to issuance and acceptance of any contractual agreement with the recommended Vendor even if the Board of MMAGIC Commissioners has formally accepted a proposal.
- MMAGIC will issue a contract for the acquisition of services specified as a result of an award made in reference to this document.
- No prepayment of any kind will be made prior to implementation.
- Successful Vendor may have access to private or confidential data maintained by the MMAGIC to the extent necessary to carry out its responsibilities of the contract.
- Successful Vendor agrees all data, records and information, which the proposer, including its agents and employees, obtains access to for the purposes of this proposal, remains at all times exclusively the property of MMAGIC. Vendor agrees it will take all reasonable steps and the same protective precautions to protect MMAGIC's proprietary information from disclosure to third parties as with successful Vendor's own proprietary and confidential information. **Vendor agrees all data, regardless of form that is generated because of this Request for Proposal is the property of MMAGIC.**
- Vendor certifies this proposal is submitted without collusion, fraud, or misrepresentation as to other Vendors, so that all proposals for the project will result from free, open, and competitive bidding among all proposers.

Open Records and Proprietary Information

It is understood that any proposal and any/all referencing information submitted in response to the Request for Proposals will become the property of MMAGIC and will not be returned. All responses to the RFP submitted by Vendors shall be deemed public documents at the time opened by MMAGIC. As a governmental entity, MMAGIC is subject to making records available for disclosure after MMAGIC acceptance of any proposal. The RFP is intended to be worded in a manner so as not to elicit proprietary information from the Vendor. If proprietary information is submitted as part of the proposal, such information is to be labeled proprietary and be accompanied by a request that the information is to be returned at the end of the selection process. MMAGIC will use reasonable discretion with regards to disclosure of proprietary information contained in any response but cannot guarantee such information will not be made public. Any proposal that is submitted with a blanket statement or limitation that would prohibit or limit such public inspection shall be considered non-responsive and shall be rejected.

Contract Period

The agreement for services will become effective upon execution of a contract.

The MMAGIC reserves the right to cancel the contract and discontinue services with a 30 day written notice as a result of the failure of the contracted Vendor to provide acceptable services as delineated in response to this document, or if cancellation is determined to be in the best interest of MMAGIC. In the event of termination of an agreement as a result of a breach by successful Vendor hereunder, MMAGIC will not be liable for any fees and may, at its sole option, award an agreement for the same services to another qualified firm with the best proposal, or call for new proposals and award an agreement for the same services to another qualified firm to provide services.

Compensation

The successful Vendor will agree to provide an itemized billing for fees and expenses based on the agreed upon fee schedule.

Confidential Matters and Data

Successful Vendor agrees all data, records and information, to which the successful Vendor, its agents, and employees, which is the subject of this proposal obtain access, remains at all times exclusively the property of MMAGIC. Successful Vendor agrees all such data, records and information constitutes at all times proprietary information of MMAGIC. Successful Vendor agrees it will not disclose, provide, or make available any of such proprietary information in any form to any person or entity. Additionally, successful Vendor agrees it will not use any names or addresses contained in such data, records and information for the purpose of selling or offering for sale any property or service to any person or entity who resides at any address in such data. Additionally, successful Vendor agrees it will not sell, give or otherwise make available to any person or entity any names or addresses contained in or derived from such data, records and information for the purpose of allowing such person to sell or offer for sale any property or service to any person or entity named in such data.

Indemnification and Insurance

Vendor shall indemnify MMAGIC, including, but not limited to, its elected and appointed officials, officers, employees and agents, with respect to any claim arising, or alleged to have arisen from negligence, and/or willful, wanton or reckless acts or omissions of the Vendor, its subcontractor, agents, servants, officers, or employees and any and all losses or liabilities resulting from any such claims, including, but not limited to, damage awards, costs and reasonable attorney's fees. This indemnification shall not be affected by any other portions of any agreement relating to insurance requirements. The Vendor shall maintain and require of any and all of its subcontractors working on this project to maintain at all times at their expense general aggregate insurance with limits of not less than \$1,000,000 per accident.

Bond Requirements

Performance Bond: Vendor shall provide at its own expense, a performance bond for 100% of the total annual payment due to Vendor as set forth herein. The surety company providing the performance bond must be licensed to do business as a surety insurer in the State of West Virginia. The surety agreement must not contain any conditions or reservations.

Unless otherwise specified herein, the bonds shall be written in a form meeting the current laws and regulations in the State of West Virginia. The Vendor shall require the Attorney In Fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his Power of Attorney. The surety company shall be appropriately licensed to do business in the State of West Virginia, shall have been in business continuously for at least five years and have the following minimum ratings: Best's Policyholder's Rating of "A" or "B."

The Surety Company shall not expose itself to any loss on any one risk or an amount exceeding ten percent (10%) of its surplus to policyholders, provided: Any risk or portion of any risk shall have been reinsured (in which case these minimum requirements contained herein also apply to the insuring carrier) in assuming insurer authorized or approved by the Insurance Commissioner to do such business in the state shall be deducted in determining the limitation of risk prescribed in this section.

Legal Notice

MMAGIC re-asserts the right to refuse any and all proposals and waive any or all technicalities, as determined by either the project manager representing MMAGIC or the MMAGIC Associate Committee.

All persons awarded and/or entering into purchase orders with MMAGIC shall be subject to and required to comply with all applicable City, State, and Federal provisions. MMAGIC has an affirmative action program. Any Vendor will be required to include the following statement in any contract with MMAGIC:

"Vendor shall not discriminate in the employment of persons engaged in the performance of this Agreement on account of race, color, national origin, ancestry, religion, sex, marital status, physical handicap, or medical condition, in violation of any federal or state law. Vendor shall comply with all requirements of MMAGIC pertaining to affirmative action with regard to employment while this Agreement is in effect."

Digital Color Orthoimagery

Scope of Work

1. Introduction

MMAGIC (herein may be referred to as “entity”) is inviting proposals from qualified firms for professional services related to the acquisition of color digital orthophotography.

1.1 Definition of Project Area

The total project area includes approximately 366 square miles and is shown in Attachment A.

1.2 Scope of Work

This scope of work for MMAGIC shall present the specifications to acquire natural color 4-inch resolution digital orthoimagery to be delivered in GeoTIFF and MrSid formats. The project entails the acquisition of digital aerial imagery for an approximate 366-square miles area. The resulting 4-inch pixel resolution digital orthoimagery shall meet American Society of Photogrammetry & Remote Sensing (ASPRS) [Class 2] at 1: 1,200-scale (1"=100') for the project area.

The Vendor shall perform a comprehensive range of photogrammetric mapping services including:

- Leaf-off acquisition of digital aerial imagery.
- Survey control (ground and airborne).
- Fully Analytical Aerial triangulation.
- Digital Terrain Model (DTM)/Digital Elevation Model (DEM) developed to support orthophoto production.
- Rectify color (RGB) orthoimagery at a 4-inch ground sample distance

2. Technical Specifications

Coordinate system, positional accuracy and flight dates

2.1 Coordinate System and Datum

All data shall be geo-referenced to the appropriate West Virginia State Plane Coordinate System, North American Datum (NAD) 1983 State Plane West Virginia North FIPS 4701 Feet. All final values shall be in US Survey Feet.

2.2 Accuracy Specifications

Final ortho image products shall meet ASPRS Class 2 accuracy for 4-inch ground sample distance as defined below. Specify target map scale and ASPRS Class for each GSD.

ASPRS Accuracy for 0.5 ft GSD and 1 ft orthoimagery			
Target Map Scale		Limiting RMS Error, ft	
1 in. = x ft	Ratio ft/ft	ASPRS Class 1	ASPRS Class 2
1" = 100'	1:1,200	1 ft	2 ft
1" = 200'	1:2,400	2 ft	4 ft
1" = 400'	1:4,800	4 ft	8 ft

2.3 Flight Specifications

2.3.1 Flying dates

Imagery shall be flown when deciduous foliage is under primarily leaf-off conditions. The target flight window shall be within February and March of 2025.

2.3.2 Flight hours

The sun angle for all flights shall be at least (30) degrees above horizon and imagery shall be acquired between 10:00 am and 2:00 pm local time. In no case shall imagery be undertaken when the ground is obscured by snow, fog, smoke, haze, or dust. Aerial imagery shall be flown when streams are their normal banks, and cloud shadows appear on less than five percent (5%) of the area in any one image. Photographs shall not contain objectionable shadows caused by relief or low solar altitude.

3. Production Methodology Specifications

Aerial acquisition, geodetic engineering, and photogrammetric post processing requirements

3.1 Aerial Acquisition

3.1.1 Digital Aerial Camera

Aerial Sensors/Cameras used to acquire project imagery shall have current USGS certification, or in the case of digital sensors a current USGS digital aerial sensor type certification:

- Ground resolution equal to or better than 4-inch resolution.

- Generating three-band imagery from separate co-registered red, green, and blue bands.
- Support high geometric accuracy and forward motion compensation.

3.1.2 Flying Height

The aerial acquisition flying height shall be capable of achieving a ground sample distance of 0.33-foot (output resolution of 4-inch resolution). Flight height shall be appropriate for 1:1,200 scale (1"=100') orthophotos. If Vendor intends to fly higher than 5,400 feet above mean terrain a prior-approved guarantee shall be provided that the horizontal accuracy standard shall be met.

3.1.3 Flight Planning

A flight map shall be submitted for the given project area prior to acquisition. Flight line features shall be attributed with appropriate identification information including project boundary, line numbers, and exposure stations, and ground control locations.

The principal points of the first two and the last two exposures of each flight line shall fall outside the boundaries of the area to be covered by the flight, and all side boundaries shall be covered by a minimum of 25% of the photo image footprint. The aerial mission shall be flown with coverage extending beyond the project boundary to ensure adequate coverage.

The exterior project edges shall cover a minimum of 300 meters or 1,000 feet beyond the project boundary. 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 (or polygon, if the project has an irregular shape).

3.1.4 Stereo Images

Overlapping images in each flight line and between flight lines shall provide full stereoscopic coverage of the area to be mapped. Appropriate endlap of 60%, sidelap of 30%, and adjustment for crab and tilt shall be accounted for to meet the output specification.

3.1.5 Aerial Imagery Review

Vendor shall review the processed digital frames for the following:

- Adherence to the flight plan.
- Ground Sample Distance.
- Density.
- Contrast.
- Hot spots.
- Clarity.
- Shadow detail.
- Overall quality.

3.1.6 Re-flights

Unacceptable aerial imagery shall be corrected at no additional cost to the MMAGIC, with the re-flight coverage overlapping the acceptable imagery by at least two (2) stereo models.

3.1.7 Building Lean

Imagery is unacceptable if tall buildings in urban areas obscure features in the interior of a city block. Flight plan shall be adjusted accordingly to prevent excessive building lean.

3.2 Global Positioning System (GPS) Ground Control

The primary purpose of the required survey control for this project is to produce an aero-triangulation solution accurate enough for orthophoto production. The Vendor shall tie into existing control networks whenever possible, and any ground control established for this project must meet minimum accuracy requirements, and reporting requirements set forth here.

Ground control shall be established with survey grade instrumentation under the direct supervision of a licensed professional surveyor. Vendor shall coordinate GPS control survey with the project manager representing MMAGIC.

3.2.1 Collect airborne Global Positioning System (GPS) data

Camera position (latitude, longitude, and elevation) shall be recorded at the instant of exposure with airborne GPS. Airborne GPS data shall be differentially corrected and organized as individual data sets grouped by corresponding film

roll (if applicable) or flight line. Differentially corrected Airborne GPS positional data shall be stored on portable media, in a nonproprietary format mutually agreeable to the customer and their Vendor. The horizontal root-mean-square error (RMSE) of the airborne GPS control data shall not exceed 0.2m. The vertical RMSE of the Airborne GPS control shall not exceed 0.3m.

3.2.2 Monumentation

The Vendor shall be responsible for pre-flight paneling and/or post-flight photo identification of all control points. The Vendor shall recommend and coordinate the placement of control target locations of a sufficient quantity and size to control the photogrammetric accuracy specifications required for 1"=100' map scale.

Panels shall be removed upon the completion of the project. Actual placement of control paneling shall be a negotiated item in coordination with MMAGIC to determine most cost-effective methods for placement, maintenance, and removal.

The Vendor will provide a GPS report of these control target locations with State Plane NAD (83) West Virginia North coordinates to MMAGIC.

3.2.3 Permission

The Vendor shall be responsible for obtaining all permits, permission, or traffic control that may be required to enter upon any lands or use of any Public Right-of Way where access to accomplish the ground control survey is necessary. The permits, permission, or traffic control shall include obtaining permission to set or establish targets prior to the flight, for identification on the imagery.

3.2.4 Survey Report and Deliverables

Upon completing the ground control phase, the Vendor shall prepare and submit a Final Survey Report to the MMAGIC. The report shall provide the following information:

- Detailed description of ground control coordinates and locations.
- Description of coordinates captured from the airborne GPS collection.
- Summary of accuracies achieved, problems encountered, and a statement of the overall quality of the survey in terms of its use with airborne GPS.
- Schematic control diagram of the survey records on a map for all basic horizontal control used in the project.
- Digital file of ground coordinates and airborne GPS coordinates.

3.3 Aerial Triangulation

Aerotriangulation data, if used in the orthorectification process, shall consist of a minimum of refined image coordinates and adjusted ground coordinates. If Aerotriangulation is performed, the Vendor shall provide a comprehensive AT report.

3.4 Digital Terrain Model (DTM)/Digital Elevation Model (DEM)

A Digital Terrain Model (DTM)/Digital Elevation Model (DEM) shall be developed at a density level necessary to support the orthophoto production.

3.4.1 DTM/DEM Production

Terrain/elevation data used in the development of the DTM/DEM shall be captured by photogrammetric techniques using a 1st order analytical stereoplottor or a softcopy workstation or derived from recent LIDAR-derived data. The DTM/DEM shall consist of points spaced at regular intervals along a grid, points of significant high or low elevations, and ortho specific breaklines at all significant terrain breaks.

3.4.2 DTM/DEM Restrictions

DTM/DEM data from a prior orthophoto project shall not be used for a new project unless approved. If approved by the licensed surveyor or engineer representing the MMAGIC, DTM/DEM data from a prior ortho project may be used for a new project after extensive updating by the Vendor. A DTM/DEM is not to be stored as a record (Z component) for each pixel of the orthophoto image.

3.4.3 DTM/DEM Deliverables

DTMs shall be tiled according to project tiling scheme and delivered in a format compatible with MMAGIC's hardware and software platforms. A written report (or metadata) listing the practices and procedures used to produce the DTM, including QA/QC steps.

3.4.4. DTM/DEM Ownership

The MMAGIC shall maintain all rights of ownership for DTM/DEM.

3.5 Digital Orthoimagery

Digital orthoimagery shall be produced from the processed digital imagery. Each processed image (raster file) shall be geo-referenced to simulate its position in space at the time of exposure. The Digital Terrain Model shall be applied to the raster file to rectify the image to eliminate distortion. All orthophotos shall be edge-matched, radiometrically corrected, and color

balanced. Once the imagery has been processed, it shall be structured and formatted in a seamless image database and sampled to the required 0.33-foot (4 inch resolution) pixel resolution.

3.5.1 Resolution

The final output resolution desired is 4-inch resolution ground sample distance.

3.5.2 Radiometric Characteristics

All orthophotos shall be composed of three (3) R, G, B spectral bands: Red (R), Green (G), and Blue (B). The radiometric resolution of each band shall be eight (8) bits at minimum, where the image brightness for each band is represented by 256 levels, ranging from 0 to 255.

3.5.3 Image Quality

Orthophotos shall not contain defects such as out-of-focus imagery, marks, scratches, or inconsistencies in tone and density between individual orthophotos.

Radiometric Distortion - The Vendor shall correct distortions caused by elevated or depressed structures such as bridges, rail beds, overpasses, and steep terrain. The MMAGIC shall reject any image that contains these types of distortions.

Image Mosaicking - Where two or more digital orthophoto images are mosaicked, the image judged to have the best contrast shall be used as the reference image. All other images shall have their brightness values adjusted to that of the reference image. Join lines between overlapping images shall be chosen so as to minimize tonal variations. Localized adjustment of the brightness values shall be performed to minimize tonal differences between join areas. Visible seams or sutures within a digital orthophoto which exhibit a noticeable “edge” or “feather” effect shall be grounds for rejection of that digital orthophoto.

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

Band to Band Registration - Misalignment between any color bands shall not exceed 1 pixel.

3.5.4 Non-Image Data

Images shall not contain any non-image data. Non-image data includes

photographic frame borders, fiducial marks, artifacts, and titling. Non-image data also includes "fill" induced by lack of elevation surface model coverage that results in white, black, or spurious intensity values.

4. Delivery Specifications

Tiling scheme, delivery media, and final deliverables

4.1 Tiling Scheme

The Vendor shall label each GeoTIFF with the Filename as indicated by the Index Grid files provided by the MMAGIC, i.e. 4,000 feet x 4,000 feet, 5,000 feet x 5,000 feet, etc.

4.2 Data Delivery

All orthophoto data shall be delivered on USB 2/3 Hard Drive or electronic media as specified by the MMAGIC. Each disk or drive shall contain the following reference information:

- Identification number.
- Name of MMAGIC.
- Consultant Name
- Date of delivery.
- Listing of tiles.

A final review of all data will be conducted by MMAGIC and checked for compliance with project specifications and media readability. Data shall be delivered 6 months after collection of imagery. MMAGIC reserves the right to charge a late fee if data is not delivered in full after the agreed time period.

4.3 Project Deliverables

- Project Work Plan in both hard copy and digital format.
- Project Flight and Survey Control Map (pre-flight).
- Final Survey Control Report in both hard copy and digital format.
- Final Aerial Triangulation Report in both hard copy and digital format.
- A statement of accuracy of the Orthophoto in both hard copy and digital format.
- 3-band (RGB 4-inch resolution) pixel color digital orthophoto imagery, uncompressed

GeoTIFF files.

- MMAGIC-wide [20:1] compressed image (MrSID format).
- Updated Digital Terrain Model.
- FGDC Compliant Metadata in XML format for each tile (provide sample).

All final deliverable formats shall be coordinated between the Vendor and the MMAGIC. All digital deliverables shall be fully compatible with MMAGIC's hardware and software platforms.

4.4 Quality Control

Quality Control will be performed by the Vendor to ensure that all processes and procedures used, and metadata produced by the Vendor were adequate to meet all specifications cited as deliverables.

1. The Vendor shall perform an inspection of the data looking for and correcting the following:
 - a. Completeness of data to cover the specified geographic extent, with no omissions or corrupt data.
 - b. Tonal balancing problems across the block.
 - c. Ground Sample Distance to ensure that it meets the specified resolution.
 - d. Mis-joins between linear features greater than 3 pixels
 - e. Cloud cover, smoke/haze, corrupt data, and void areas.
 - f. Extreme tonal or color variation across seamlines.
 - g. Excessive horizontal displacement along seamlines in images (more than ± 3 pixels along transportation features, unless project specifications specifically state otherwise).
 - h. Excessive tilt in bridges, buildings, and other raised features.
 - i. Transportation features that are obstructed by buildings or shadows.
 - j. Tall buildings in urban areas that obscure features in the interior of a city block.
 - k. Clipping of features (e.g. radio towers, water tanks, buildings) at image file boundaries.
 - l. Building/structure, bridge, or road warp that may indicate bad elevation data.
 - m. Smearing.
 - n. Evidence of oversaturation or undersaturation as a result of image processing or histogram manipulation.
 - o. Evidence of image compression.

2. Perform Horizontal Accuracy Test

The Vendor shall collect test-points to verify the horizontal accuracy of the orthoimagery production process. Test-point control must be completely independent of control used during aerotriangulation and data production.

The jurisdiction may select an independent sample of test-points to assess the horizontal accuracy of the delivered orthoimagery. The sampling design, data collection, statistical analysis, and reporting format shall follow positional accuracy guidelines recommended by the National Standards for Spatial Data Accuracy (FGDC, 1998). If the tested orthoimagery fails to meet the prescribed ASPRS accuracy standards the work product may be rejected by the jurisdiction. The Vendor will be provided with an opportunity to correct systematic defects. If systematic defects cannot be identified and corrected the jurisdiction may require the Vendor to recollect orthoimagery data.

MMAGIC has the right to perform its own quality control and due diligence. Any image not meeting the requirements of this Scope of Work may be rejected for non-compliance. MMAGIC shall have ninety (90) calendar days to evaluate a deliverable.

4.5 Ownership of Data

The Associate Members of the Monongalia Morgantown Area Geospatial Information Consortium (MMAGIC) and any additional agencies who provide a monetary cost share in this contract, or who provide monetary compensation to Monongalia County directly, shall be considered joint owners of the data provided from this project. Distribution of data from this project from any person or organization shall be done by acknowledging that it was provided by MMAGIC in its documentation and metadata.