

CERTIFIED COPY OF ORDER

STATE OF MISSOURI }
County of Boone } ea.

January Session of the January Adjourned

Term. 20 19

In the County Commission of said county, on the 17th day of January 20 19

the following, among other proceedings, were had, viz:

Now on this day the County Commission of the County of Boone does hereby recognize January 21, 2019, as Martin Luther King Day, and honors Dr. King's leadership, sacrifices, and his vision for the future.

Done this 17th day of January, 2019.

ATTEST:

Brianna L. Lennon
Brianna L. Lennon
Clerk of the County Commission

Daniel K. Atwill
Daniel K. Atwill
Presiding Commissioner

Fred J. Parry
Fred J. Parry
District I Commissioner

Janet M. Thompson
Janet M. Thompson
District II Commissioner

PROCLAMATION HONORING REVEREND DR. MARTIN LUTHER KING, JR.

- WHEREAS*, Reverend Dr. Martin Luther King, Jr., renowned leader of the American Civil Rights Movement, was born on January 15, 1929 in Atlanta, Georgia; and
- WHEREAS*, Dr. King devoted, and ultimately sacrificed, his life to advancing equality, social justice and opportunity for all, inspired by his vision of a society where individuals were not judged “by the color of their skin but by the content of their character”; and
- WHEREAS*, between 1955 and 1968, Dr. King led his fellow Americans in a movement toward legal equality for African Americans in the United States, using the power of words and acts of nonviolent resistance, such as protests, grassroots organizing, and civil disobedience; and
- WHEREAS*, Dr. King continued his life’s mission through similar campaigns focused on poverty and international conflict, never losing sight of his principled beliefs that men and women everywhere, regardless of color or creed, are equal members of the human family; and
- WHEREAS*, in 1963, Dr. King was a driving force behind the March on Washington, which drew over a quarter-million people, at which he gave his famous “I Have a Dream” speech; and
- WHEREAS*, Dr. King was named Time Magazine’s Man of the Year for 1963 and, in 1964, at the age of 35, Dr. King became the youngest person to win the Nobel Peace Prize; and
- WHEREAS*, as a result of the movement led by Dr. King, Congress passed the landmark Civil Rights Act in 1964 and the Voting Rights Act in 1965; and
- WHEREAS*, tragically, Dr. King’s leadership, so noted for its nonviolence and tenacity, was cut short on April 4, 1968, when he was assassinated at the Laurel Motel in Memphis, Tennessee; and
- WHEREAS*, Dr. King’s legacy lives on as our nation continues to be inspired by and strive for the realization of his vision of universal equality and justice; and
- WHEREAS*, as we commemorate Dr. King’s life on this third Monday of January, 2019, we reflect on the imperative of continuing Dr. King’s work, through both nonviolent words and actions, in order to achieve his vision of a future in which we have “transformed the jangling discords of our nation into a beautiful symphony of brotherhood.”
- THEREFORE*, The Boone County Commission does hereby recognize January 21, 2019, as Martin Luther King Day, and encourages residents to reflect on Dr. King’s vision and how they can work toward realization of this vision in their lives, communities and nation.

IN TESTIMONY WHEREOF, this 17th Day of January, 2019.

Daniel K. Atwill, Presiding Commissioner

Fred J. Parry, District I Commissioner

Janet M. Thompson, District II Commissioner

ATTEST:

Brianna L. Lennon, County Clerk

CERTIFIED COPY OF ORDER

STATE OF MISSOURI }
County of Boone } ea.

January Session of the January Adjourned

Term. 20 19

In the County Commission of said county, on the 17th day of January 20 19

the following, among other proceedings, were had, viz:

Now on this day the County Commission of the County of Boone does hereby award bid 48-16NOV18 for Photogrammetric Mapping Products and Services to Surdex Corporation of Chesterfield, Missouri.

Terms of the award are stipulated in the attached Purchase Agreement. It is further ordered the Presiding Commissioner is hereby authorized to sign said Purchase Agreement.

Done this 17th day of January, 2019.

ATTEST:

Brianna L. Lennon
Brianna L. Lennon
Clerk of the County Commission

Daniel K. Atwill
Daniel K. Atwill
Presiding Commissioner

Fred J. Parry
Fred J. Parry
District I Commissioner

Janet M. Thompson
Janet M. Thompson
District II Commissioner

Boone County Purchasing

Liz Palazzolo
Senior Buyer



613 E. Ash, Room 109
Columbia, MO 65201
Phone: (573) 886-4392
Fax: (573) 886-4390

MEMORANDUM

TO: Boone County Commission
FROM: Liz Palazzolo, CPPO, C.P.M.
DATE: January 15, 2019
RE: 48-16NOV18 for Photogrammetric Mapping Products and Services

Boone County issued a Project Assessment Quotation (PAQ) Request requesting responses from the four State of Missouri contractors offering Photogrammetric Mapping Products and Services through cooperative procurement (contracts CS170285001 through CS170285004). Three responses were received, please see the attached response tabulation and evaluation. The response from Surdex Corporation of Chesterfield, Missouri is the lowest and best response.

The initial contract period will run from the Date of Award through December 31, 2019.

Payment will be paid from the following Department/Account:

- Department 2010 Assessment/Account 71100 – Outside Services– Total: \$ 168,870.00

Attachments: Response Tabulation, Evaluation Report with Cost Evaluation

/lp

cc: Nathan Mattox, GIS Manager, IT
File PAQ Request #48-16NOV18

PAQ Request #48-16NOV18 - Option 1/Scenario 4 Cost Points for Ortho Product for Chariton, Cooper, Howard and Moniteau Counties, and LIDAR Product for Boone County and MU

Boone County, Chariton County, Cooper County, Howard County, Moniteau County and MU Participating

Ortho and LIDAR Products	Surdex	Sanborn	QSI, inc.
<u>Total Price Without Deductions from BEC, MDC, and City of Columbia Support</u>			
Total Price All Participants	\$ 347,500.00	\$ 322,484.23	\$ 377,103.85
COST POINTS ORTHO for All and LIDAR For Boone County and MU	46.40	50.00	42.76
<u>Total Price With Deductions from BEC, MDC, and City of Columbia Support</u>			
Total Price All Participants	\$ 266,648.00	\$ 241,632.23	\$ 296,251.85
COST POINTS ORTHO for All and LIDAR For Boone County and MU	45.31	50.00	40.78

Respondent 1: Surdex Corporation

- Surdex Corporation’s PAQ response is responsive to the mandatory terms and conditions of PAQ Request #48-16NOV18 for Photogrammetry Mapping Products and Services.

Experience and Expertise: 30 Points of Maximum 30 points

Strengths:

- Been in operation and under the same ownership since 1954
- Clients include federal, state, local government and private customers
- References include Missouri clients including a St. Louis County Consortium similar to the Boone County consortium
- Cited 3 specific references for whom the same kind of work has been performed. The St. Louis Consortium has had Surdex perform two projects for them
- Has previously performed satisfactory, timely work for Boone County as well as other consortium entities involved in the current Boone County consortium
- Senior staff averages over 25 years photogrammetry experience
- Project Manager has 34 years professional experience and is a Certified Photogrammetrist

Concerns:

- None

Proposed Method of Performance and Contractor Support: 20 Points of Maximum 20 Points

Strengths:

- Headquartered with a production facility in Chesterfield, Missouri
- Fleet of 10 aircraft supported by FAA certified inspections – addressed maintenance and repair of aircraft
- Identified equipment is highly suitable for the work to be conducted
- Addressed time-line for completing flights and producing final work product with specificity that incorporates reference to client review
- Will complete Ortho Project in 122 days
- Will complete LiDAR project in 60 days
- Will use subcontractors to conduct field survey work

Concerns:

- None

Respondent 2: Quantum Spatial, Inc.

- Quantum Spatial Inc.'s response is responsive to the mandatory terms and conditions of PAQ Request #48-16NOV18 for Photogrammetry Mapping Products and Services.

Experience and Expertise: 25 Points of Maximum 30 Points

Strengths:

- Has been in the business since 1969
- Clients include federal, state, local government
- QSI works with the USGS collecting high-resolution LiDAR data in South and South-Central Missouri
- Identified staff have experience ranging from 11 to 37 years
- Project Manager has over 22 years' experience project management and is Certified as a GIS Professional and PMI Project Management Professional

Concerns:

- None

Proposed Method of Performance and Contractor Support: 15 Points of Maximum 20 Points

Strengths:

- Identified 13 planes for flights equipped with suitable equipment
- Will complete Ortho Project in 120 days using 2 planes and 7 days for flights
- Will complete LiDAR project in 90 days using 1 plane and 3 days for flights

Concerns:

- Unlike Surdex there is no reference to field survey work
- LiDAR project takes longer than Surdex
- QSI is based out of Wisconsin: A local presence, while not required, is seen as a strength to aid communication and coordination as the project gets underway and project deliverables are prepared

Respondent 3: The Sanborn Mapping Company

- The Sanborn Mapping Company's response is responsive to the mandatory terms and conditions of PAQ Request #48-16NOV18 for Photogrammetry Mapping Products and Services.

Experience and Expertise: 12 Points of Maximum 30 Points

Strengths:

- Has been in the business of geospatial mapping since 1866; planimetric mapping since 1966; and orthography since 1998.
- Clients include federal, state, local government and private customers
- References include a large listing of governments including several Missouri projects
- Identified 2 specific references for whom the same kind of work has been performed
- Identified staff have experience ranging from 7 to 27 years
- Project Manager has over 17 years' experience in the field of GIS and aerial mapping including project management

Concerns:

- Of significant concern to the County is past experience local counties have had with Sanborn. Sanborn was Cole County/Jefferson City's aerial photogrammetry contractor in 2010. A mechanical malfunction during flight yielded imagery that was completely unusable. Of specific concern was the delay in notification of a problem that should have been identified immediately. This delay caused the partners to miss the flying window in 2010.

Proposed Method of Performance and Contractor Support: 15 Points of Maximum 20 Points

Strengths:

- Identified 8 planes for flights equipped with suitable equipment
- Will complete Ortho Project in 120 days using 1 plane and 7 days for flights
- Will complete LiDAR project in 120 days using 1 plane and 7 days for flights

Concerns:

- Unlike Surdex there is no reference to field survey work
- There is the dedication of only 1 plane to the Ortho project and 1 plane to the LiDAR project, whereas Surdex has dedicated 3 planes and 2 planes respectively.
- LiDAR project takes twice as long
- Sanborn is based out of Colorado: A local presence, while not required, is seen as a strength to aid communication and coordination as the project gets underway and project deliverables are prepared

SUMMARY:

Surdex presents the strongest offer in terms of experience, expertise and performance method, and is scored **50 of 50 points**. Surdex has provided reliable service in the past to the counties and MU, has supportive references from whom similar work has been performed, and presents an experienced team for conducting the aerial photogrammetry work. Surdex will complete orthophotography deliverables in 122 days compared to 120 for both Sanborn and QSI, Inc.; Surdex's timeframe for completing the LiDAR project is the best at 60 days compared to 90 days for QSI, Inc. and 120 days for Sanborn.. While all offerors' equipment is suitable and appears capable of performing the orthophotography and LiDAR work, Surdex's proposal includes some reference to aircraft upkeep and maintenance that appears missing from Sanborn's and QSI's proposals. Additionally, Surdex will use field surveyors which is seen as adding a degree of accuracy to their final mapping deliverables. Of the three vendors, Surdex has identified the most plane resources to be dedicated to the project-- 3 planes for the ortho flights, and 2 for the LiDAR flights. Also as a Missouri-based company, Surdex's ability to coordinate with Boone and the other counties including MU about project flights is seen as better facilitated.

QSI, Inc. scores next highest in terms of Experience, Expertise, and Proposed Method of Performance , and is scored **40 of 50 points**. Their experience is comparable to Surdex's, although Surdex has been in business slightly longer. QSI, Inc. has not been used previously by Boone County although QSI, Inc.'s references appear to be supportive of doing the kind of work needed. QSI's identified project manager has 22 years' experience which is satisfactory but not as long as Surdex's project manager with 34 years' experience. Both are certified—Surdex's project manager is certified as a Certified Photogrammetrist, and QSI, Inc.'s is certified as a GIS Professional and PMI Project Management Professional. QSI, Inc.'s turn-around time for orthophotography is similar to Sanborn's, and just a couple days quicker than Surdex's, but QSI, Inc. is about 33% longer to finish a LiDAR deliverable in comparison to Surdex. QSI Inc. will dedicate 2 planes to the ortho project and 1 plane to the LiDAR project. In comparison to Surdex, QSI, Inc. is not Missouri-based; while a local presence is not required and does not compromise QSI, Inc. ability to satisfactorily perform, being on the same turf allows for better coordination about weather changes' impact on flights.

Sanborn scores the lowest in terms of Experience, Expertise, and Proposed Method of Performance, and is scored **27 of 50 points**. While Sanborn has supportive references in the field of work the counties require, past experience with Sanborn has influenced the County's assessment of Sanborn's reliability overall. Sanborn's project manager has 17 years experience which is the least compared to the identified project managers for Surdex and QSI, Inc., but he holds certification as a Project Management Profesional. Sanborn's timeline for completing the orthophotography deliverable is like QSI, Inc.'s and only a couple days quicker than Surdex's. Sanborn's timeline for completing LiDAR is the longest of the three vendors. Additionally, compared to Surdex and QSI, Inc. Sanborn has identified the least dedicated number of planes to conduct the mapping, 1 each for both the ortho and LiDAR compared to 3 and 2 respectively for Surdex, and 2 and 1 respectively for QSI, Inc. In comparison to Surdex, Sanborn is not Missouri-based; while a local presence is not required and does not compromise Sanborn's ability to satisfactorily perform, being on the same turf allows for better coordination about weather change's impact on flights.

Aerial Photogrammetry PAQ Request #48-16NOV18			
	Surdex	Sanborn	Quantum Spatial
Method of Performance and Contractor Support			
Location of Vendor	Chesterfield, Missouri headquarters and production facility	Colorado Springs, CO	Sheboygan Falls, WI
Identified Equipment Dedicated to Project	<p>Fleet of 10 aircraft supported by FAA-certified inspection, maintenance and repair will use 3 for Ortho flights and 2 for LiDAR flights;</p> <p>Image Sensors include the Leica ADS100, and the Leica DMC-1 - have several of each LiDAR Sensors include the Teledyne Optech Galaxy</p> <p>Have 12 workstations and 3 Summit Evolution Microstations to perform stereo compilations and mapping; use GIS/CADD software: ESRA ArcGIS for Desktop; 3 autoCAD; 14 Bentley Microstation; 1 GeoPak Site, and 2 GeoPak Descartes Inroads - AND Photogrammetric software Image Station Aerial Triangulation (iSAT), 14-Softplotter, and Leica XPro plus Surdex Enterprise Database tools.</p>	<p>Vexcel Imaging UltraCam Eagle Camera</p> <p>Identify 8 planes for airborne data collection - the planes are equipped with a variety of equipment that includes the Vexcel UltraCam Condor and Eagle cameras, including MIDAS Oblique sensors, one visual Intelligence iOne n-Oblique sensor two Leica ALS-70HP Airborn LiDAR sensors, and two Leica RCD30 Aerial Camera systems</p>	<p>QSI's in-house resources include 13 aircraft with an additional 3 UAS systems; 18 digital cameras, 12 LiDAR sensors, 25 DAT/EM Summit Evolution Photogrammetry licenses, 29 Ortho workstations; 130 LiDAR workstations; along with multiple geophysical analysis software. has Leica ALS0 70 LiDAR scanners including LiDAR software ALS 50 PostProcessor, Optech DASHMap, Bentley Microstation, Dell Precision P4 Dual Processor 4GB RAM, FME, GeoCue, LP 360 EQC, and QT Modeller. Surveying equipment includes Trimble/Leica Dual Frequency GPS Receivers, Leica/Zeiss/Sokkia Auto Levels; Leica/Trimble/Topcon Total Stations; Trimble Geomatics Office Software, GeoLab2, and Pegasus-EX Portable Weather Stations; and 23 survey vehicles.</p>
Project Details: Number of Flight Lines, Side-Lap, Front-Lap			
Time for Completing Ortho Project	<p>Total of 122 Calendar Days for Orthophotography Product/Delivery to Participating Entity:</p> <p>Will use 3 planes for Ortho - range of 60 days for flight dates</p> <p>Flight Acquisition: 2/1/19 - 3/31/19 Survey Control: 2/1/19 - 2/15/19 Aerotriangulation: 3/15/19 - 4/15/19 Ortho Production: 4/15/19 - 8/15/19 Ortho Pilot Deliverables Client Review: 8/15/19 - 9/15/19 Final Deliverables: 9/15/19 - 10/15/19</p>	<p>Total of 120 Calendar Days (calculated from the time of acquisition completion) to complete Orthophotography Product/Delivery to participating entity</p> <p>Will use 1 plane for Ortho flights; 7 days for flights</p>	<p>Total of 120 Calendar Days (after acquisition and control) to complete Orthophotography Product/Delivery to participating entity</p> <p>Will use 2 planes for Ortho flights; 7 days for flights</p>
Time for Completing LiDAR Project	<p>Total of 60 Calendar Days for LiDAR Product/Delivery to Participating Entity:</p> <p>Will use 2 planes for LiDAR - 60 days range for flight dates</p> <p>Flight Acquisition: 1/15/19 - 3/31/19 LiDAR Production: 4/1/19 - 5/30/19 Pilot Deliverables Client Review: 5/31/19 - 6/29/19 Final Deliverables: 7/1/19 - 7/30/19</p>	<p>Total of 120 Calendar Days (calculated from the time of acquisition completion) to complete LiDAR Product/Delivery to participating entity</p> <p>Will use 1 plane for LiDAR flights; 7 days for flights</p>	<p>Total of 90 Calendar Days (after acquisition and control) to complete LiDAR Product/Delivery to participating entity</p> <p>Will use 1 plane for LiDAR flights; 3 days for flights</p>
Time for Completing Mapping - MU Campus	<p>Total of 16 Calendar Days for Topographics/Planimetrics/Building Elevations Product/Delivery to Participating Entity:</p> <p>Planimetric Mapping Production: 4/16/19 - 5/1/19 Client Review: 5/2/19 - 5/17/19 Final Deliverables: 5/18/19 - 5/31/19</p>	<p>Total of 30 Calendar Days (calculated from the time of acquisition completion) to complete Topographics/Planimetrics /Building Elevations Product/Delivery to participating entity</p>	<p>Total of 60 Calendar Days (after acquisition and control) to complete Topographics/Planimetrics /Building Elevations Product/Delivery to participating entity</p>

Request for PAQ #48-16NOV18			
Aerial Photogrammetry PAQ Request #48-16NOV18			
	Surdex	Sanborn	Quantum Spatial
Experience and Reliability - Expertise of Personnel			
<i>Corporate History</i>	Surdex has been in operation since 1954 under the same ownership.	Sanborn has offered planimetric mapping since 1966; digital orthophotography since 1988, and LIDAR mapping since 1998 - has been in business of geospatial services since 1866.	Quantum Spatial, Inc. (QSI) was founded in 1969 and has an established history working with Midwestern local and state agencies, including the State of Missouri
<i>References</i>	Clientele include federal, state, and local government as well as private engineering, defense mapping and Homeland Security. Named references include the Mid-America Regional Council (MARC) in KC, MO; the St. Louis County Imagery Consortium; and Douglas County, Kansas.	Capital Region Council of Governments (CRCOG) in Hartford, CT; Pike's Peak Geospatial Alliance (PPGA) in Colorado Springs, CO. Also includes list of recent large program projects for several states, counties, and the Qatar Petroleum Nationwide Asset Mapping Program. Includes listing of Missouri projects for several Missouri cities and counties.	Wisconsin Regional Orthophotography Consortium for Ayers and Associates; Commonwealth of Kentucky Office of Information Technology
<i>Project Experience</i>	Cited 3 specific references for whom the same kind of work has been conducted. The St. Louis County Consortium had them do two projects for them.	Cited 2 specific references for whom the same kind of work has been conducted.	QSI has extensive experience providing similar services to similar coalitions and government agencies in the region and nationwide including the collection and processing of high resolution LIDAR data over 19 counties in South and South-Central Missouri for the USGS
<i>Expertise of Personnel</i>	Senior staff averages over 25 years experience; has numerous certifications in surveying and photogrammetry; Cornell Rowan will be the Project Manager - 34 years professional experience, 10 with Surdex and a Certified Photogrammetrist	Identified staff have experience ranging from 7 to 27 years. Shawn Benham is the single point of contact - has over 17 years experience in the field of GIS and aerial mapping including project management. Certified as a Project Management Professional.	Identified staff have experience ranging from 11 to 37 years. John DiGiovanni is the project manager - has over 22 years experience in project management; Certified GIS Professional and PMI Project Management Professional

**Aerial Photogrammetry
PAQ Request #48-16NOV18**

Surdex

Cornell Rowan is the project manager;
Doing all work directly with exception of
field survey work

Sanborn

Shawn Benham is the project
manager

Quantum Spatial

John DiGiovanni is the project
manager

Contractor Support

Will use David Mason & Associates and EFK
Moen for Field Survey work

Subcontractors

Boone County Purchasing

Liz Palazzolo
Senior Buyer



613 E. Ash Street, Room 109
Columbia, MO 65201
Phone: (573) 886-4392
Fax: (573) 886-4390
lpalazzolo@boonecountymo.org

MEMORANDUM

TO: File

FROM: Liz Palazzolo

RE: PAQ Request 48-16NOV18 – Aerial Photogrammetric Mapping Products and Services - Evaluation and Award

DATE: 12/27/18

Boone County used State of Missouri contracts CS170285001 through CS170285004 as cooperative contracts to request Project Assessment Quotations (PAQ's) from the four state contractors. Three PAQ responses have been received from the four state contractors in response to Boone County's request:

- 1) Quantum Spatial of Sheboygan Falls, Wisconsin
- 2) Surdex Corporation of Chesterfield, Missouri
- 3) The Sanborn Map Company of Colorado Springs, Colorado

It is noted for the record that the fourth contractor, Woolpert, Inc. was solicited to respond but declined to make an offer.

The three proposals have been reviewed by a seven-person Evaluation Committee: Nathan Mattox, GIS Manager for Boone County; Brian Comer, Senior GIS Specialist for the University of Missouri Campus Facilities; Amanda Trimble, Assessor for Moniteau County; Darrin Gladbach, Assessor for Chariton County; Woody McCutcheon, Assessor for Howard County; Christy Linhart, Assessor for Cooper County; and Andrew Petri, Manager of Engineering and Technical Services for Boone Electric Cooperative.

The Evaluation Team found all responses in compliance with PAQ requirements. The Evaluation Team decided to evaluate the responses in terms of Method of Performance, weighted 20 points; Experience and Reliability, weighted 30 points; and Cost weighted 50 points. The evaluation approach is consistent with paragraph 3.2.1 of the PAQ Request. Purchasing conducted the cost evaluation separate from the Evaluation Committee's evaluation of the offeror's Method of Performance, and Experience & Reliability.

The PAQ Request requested pricing for several different products as follows: Part One consisted of Option One which was for the Orthophotography Product that was broken into Four Scenarios, each with internal options. Option Two in Part One requested pricing per square mile. Part Two requested pricing for LiDAR products that were broken into four different options; and Part Three requested pricing for Topographics and Planimetrics products. A bid tabulation has been prepared for all pricing submitted by the three PAQ respondents.

A summary spreadsheet showing the various products and associated pricing has been prepared. It is noted for the record that clarifications from all three respondents were requested regarding their respective pricing. Specific pricing clarification can be found with each specific PAQ response. It is further noted that corrected arithmetic totals are used in the LiDAR pricing for Quantum Spatial. When adding together the two cost components for each LiDAR option, the quoted total only matched for Option 1. A corrected total is used in the pricing spreadsheet for LiDAR Options 2, 3 and 4:

LiDAR Option 2 was quoted as \$20,736.66 but the correct total is \$20,736.65 (i.e., $\$14,397.62 + \$6,339.03 = \$20,736.65$).

LiDAR Option 3 was quoted as \$22,736.66 but the correct total is \$21,656.44 (i.e., $\$15,317.41 + \$6,339.03 = \$21,656.44$).

LiDAR Option 2 was quoted as \$22,058.47 but the correct total is \$22,058.46 (i.e., $\$15,719.43 + \$6,339.03 = \$22,058.46$).

A second round of pricing was requested for **Part One, Orthophotography, Option Four** on December 12, 2018 at the direction of the Evaluation Team. After considering the various products that the PAQ Request identified, the Evaluation Team chose **Part One, Orthophotography, Option Four** as the product/pricing option that offered the best product/pricing (affordability) option for the participants. **Part Two, Option 1, 0.7M County LIDAR** – bare earth and hydro flatten to USGS specification is also still under consideration for Boone County and the University of Missouri (MU).

Consistent with this designation, cost points for the evaluation are based only on pricing for the products the counties and the University decided to purchase. Cost points are based on cost for Part One, Orthophotography, Option Four for all participants, and Part Two, Option 1, 0.7M County LIDAR – bare earth and hydro flatten to USGS specification for Boone County and MU. Cost points used in the final evaluation does not use cost-share contributions/deductions in order to assess maximum potential cost liability to participants. Using the cost points with the MDC contribution does not change the outcome of the evaluation.

The Evaluation Team's Point Scoring Forms (each signed separately) and Evaluation Narrative along with the Cost Evaluation follow this memo. The PAQ Response from Surdex Corporation receives the maximum score when cost points are added to the subjective points for Method of Performance, and Experience & Reliability. Award of the

contract to Surdex Corporation of Chesterfield, Missouri meets requirements of awarding to the "lowest and best" response.

1 of 6

EVALUATION REPORT FORM
 PURCHASING DEPARTMENT - BOONE COUNTY - MISSOURI
 REQUEST FOR PAQ: #48-16NOV18 Aerial Photogrammetry
 Liz Palazzolo, CPPQ, C.P.M., Senior Buyer

					For Purchasing Use Only	
NAME OF OFFEROR	METHOD OF PERFORMANCE (20 Points)	EXPERIENCE & RELIABILITY (30 points)	TOTAL SUBJECTIVE POINTS (50 points)	COST POINTS (50 points)	TOTAL POINTS (Max 100 points)	
1 Surdex	20	30	50	46	96	
2 Sanborn	15	12	27	50	77	
3 Quantum Spatial	15	25	40	43	83	

We hereby attest that the subjective points assigned to each offeror above were scored pursuant to the established evaluation criteria and represent our best judgement of the subjective areas of the offerors' proposals. We have attached a brief narrative which highlights some, but not necessarily all, of the reasons for our evaluation of the proposals as indicated by the scores above. Our comments represent our opinions only and do not represent the position of the Purchasing Department of Boone County, Missouri, or any other party.

Andrew J. Petri Andrew Petri Mgr. of Eng.
 Evaluator's Signatures Evaluator Printed Name Title Boone Electric Co-Op

 Evaluator's Signatures Evaluator Printed Name Title Dept.

 Evaluator's Signatures Evaluator Printed Name Title Dept.

 Evaluator's Signatures Evaluator Printed Name Title Dept.

 Evaluator's Signatures Evaluator Printed Name Title Dept.

 Evaluator's Signatures Evaluator Printed Name Title Dept.

EVALUATION REPORT FORM

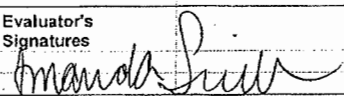
PURCHASING DEPARTMENT - BOONE COUNTY - MISSOURI

REQUEST FOR PAQ: #48-16NOV18 Aerial Photography

Liz Palazzolo, CPPO, C.P.M., Senior Buyer

					For Purchasing Use Only	
	NAME OF OFFEROR	METHOD OF PERFORMANCE (20 Points)	EXPERIENCE & RELIABILITY (30 points)	TOTAL SUBJECTIVE POINTS (50 points)	COST POINTS (50 points)	TOTAL POINTS (Max 100 points)
1	Surdex	20	30	50	46	96
2	Sanborn	15	12	27	50	77
3	Quantum Spatial	15	25	40	43	83

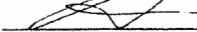
We hereby attest that the subjective points assigned to each offeror above were scored pursuant to the established evaluation criteria and represent our best judgement of the subjective areas of the offerors' proposals. We have attached a brief narrative which highlights some, but not necessarily all, of the reasons for our evaluation of the proposals as indicated by the scores above. Our comments represent our opinions only and do not represent the position of the Purchasing Department of Boone County, Missouri, or any other party.

Evaluator's Signatures		Evaluator Printed Name	Title	Dept.
Evaluator's Signatures		Evaluator Printed Name	Title	Dept.
Evaluator's Signatures		Evaluator Printed Name	Title	Dept.
Evaluator's Signatures		Evaluator Printed Name	Title	Dept.
Evaluator's Signatures		Evaluator Printed Name	Amanda Pruitt	Assessor
Evaluator's Signatures		Evaluator Printed Name	Monika	Monika Paul (C)

EVALUATION REPORT FORM
 PURCHASING DEPARTMENT - BOONE COUNTY - MISSOURI
 REQUEST FOR PAQ: #48-16NOV18 Aerial Photogrammetry
 Liz Palezzolo, CPFO, C.P.M., Senior Buyer

	NAME OF OFFEROR	METHOD OF PERFORMANCE (20 Points)	EXPERIENCE & RELIABILITY (30 points)	TOTAL SUBJECTIVE POINTS (50 points)	For Purchasing Use Only	
					COST POINTS (50 points)	TOTAL POINTS (Max 100 points)
1	Surdex	20	30	50	46	96
2	Sanborn	15	12	27	50	77
3	Quantum Spatial	15	25	40	43	83

We hereby attest that the subjective points assigned to each offeror above were scored pursuant to the established evaluation criteria and represent our best judgement of the subjective areas of the offerors' proposals. We have attached a brief narrative which highlights some, but not necessarily all, of the reasons for our evaluation of the proposals as indicated by the scores above. Our comments represent our opinions and do not represent the position of the Purchasing Department of Boone County, Missouri, or any other party.


Nathan Mattox
GIS MANAGER
BOONE COUNTY
 Evaluator's Signatures Evaluator Printed Name Title Dept.

Evaluator's Signatures Evaluator Printed Name Title Dept.

Evaluator's Signatures Evaluator Printed Name Title Dept.

Evaluator's Signatures Evaluator Printed Name Title Dept.

Evaluator's Signatures Evaluator Printed Name Title Dept.

Evaluator's Signatures Evaluator Printed Name Title Dept.

4 of 6

EVALUATION REPORT FORM
 PURCHASING DEPARTMENT - BOONE COUNTY - MISSOURI
 REQUEST FOR PAQ: #48-16NOV18 Aerial Photogrammetry
 Liz Palazzolo, CPPO, C.P.M., Senior Buyer

	NAME OF OFFEROR	METHOD OF PERFORMANCE (20 Points)	EXPERIENCE & RELIABILITY (30 points)	TOTAL SUBJECTIVE POINTS (50 points)	For Purchasing Use Only	
					COST POINTS (50 points)	TOTAL POINTS (Max 100 points)
1	Surdex	20	30	50	46	96
2	Sanborn	15	12	27	50	77
3	Quantum Spatial	15	25	40	43	83

We hereby attest that the subjective points assigned to each offeror above were scored pursuant to the established evaluation criteria and represent our best judgement of the subjective areas of the offerors' proposals. We have attached a brief narrative which highlights some, but not necessarily all, of the reasons for our evaluation of the proposals as indicated by the scores above. Our comments represent our opinions only and do not represent the position of the Purchasing Department of Boone County, Missouri, or any other party.

<u>Darin Gladbach</u>	<u>Darin Gladbach</u>	<u>Assessor</u>	<u>Chariton County</u>
Evaluator's Signatures	Evaluator Printed Name	Title	Dept.
_____	_____	_____	_____
Evaluator's Signatures	Evaluator Printed Name	Title	Dept.
_____	_____	_____	_____
Evaluator's Signatures	Evaluator Printed Name	Title	Dept.
_____	_____	_____	_____
Evaluator's Signatures	Evaluator Printed Name	Title	Dept.
_____	_____	_____	_____
Evaluator's Signatures	Evaluator Printed Name	Title	Dept.
_____	_____	_____	_____

5 of 6

EVALUATION REPORT FORM
 PURCHASING DEPARTMENT - BOONE COUNTY - MISSOURI
 REQUEST FOR PAQ: #48-16NOV18 Aerial Photogrammetry
 Liz Palazzolo, CPPO, C.P.M., Senior Buyer

	NAME OF OFFEROR	METHOD OF PERFORMANCE (20 Points)	EXPERIENCE & RELIABILITY (30 points)	TOTAL SUBJECTIVE POINTS (50 points)	For Purchasing Use Only	
					COST POINTS (50 points)	TOTAL POINTS (Max 100 points)
1	Surdex	20	30	50	46	96
2	Sanborn	15	12	27	50	77
3	Quantum Spatial	15	25	40	43	83

We hereby attest that the subjective points assigned to each offeror above were scored pursuant to the established evaluation criteria and represent our best judgement of the subjective areas of the offerors' proposals. We have attached a brief narrative which highlights some, but not necessarily all, of the reasons for our evaluation of the proposals as indicated by the scores above. Our comments represent our opinions only and do not represent the position of the Purchasing Department of Boone County, Missouri, or any other party.

John McCutcheon *John McCutcheon* *Assessor*

_____ Evaluator's Signatures	_____ Evaluator Printed Name	_____ Title	_____ Dept.
_____ Evaluator's Signatures	_____ Evaluator Printed Name	_____ Title	_____ Dept.
_____ Evaluator's Signatures	_____ Evaluator Printed Name	_____ Title	_____ Dept.
_____ Evaluator's Signatures	_____ Evaluator Printed Name	_____ Title	_____ Dept.
_____ Evaluator's Signatures	_____ Evaluator Printed Name	_____ Title	_____ Dept.

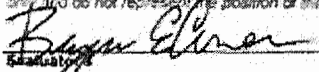
EVALUATION REPORT FORM

6 of 6

PURCHASING DEPARTMENT: BOONE COUNTY - MISSOURI
 REQUEST FOR PAQ: 048-16NOV18 Aerial Photogrammetry
 by Pasazda: EPPD, C. P. R. - Serial 8-16-18

				For Purchasing Use Only	
NAME OF OFFEROR	METHOD OF PERFORMANCE (20 Points)	EXPERIENCE & RELIABILITY (30 points)	TOTAL SUBJECTIVE POINTS (80 points)	COST POINTS (50 points)	TOTAL POINTS (Max 100 points)
1. Surdex	20	30	50	46	96
2. Sanborn	15	12	27	50	77
3. Quantum Spatial	15	25	40	43	83

I/We hereby attest that the subjective points assigned to each offeror above were scored pursuant to the established evaluation criteria and represent our best judgment of the subjective areas of the offerors' proposals. We have attached a brief narrative which highlights some, but not necessarily all, of the reasons for our evaluation of the proposals as indicated by the scores above. Our comments represent our opinions only and do not represent the position of the Purchasing Department of Boone County, Missouri, or any other party.

 **Bryan E. Comer** Sr. GIS Spec. EM/ICF
 Signatures Evaluator Printed Name Title Dept.

 Signatures Evaluator Printed Name Title Dept.

 Signatures Evaluator Printed Name Title Dept.

 Signatures Evaluator Printed Name Title Dept.

 Signatures Evaluator Printed Name Title Dept.

 Signatures Evaluator Printed Name Title Dept.

**PURCHASE AGREEMENT
FOR
PHOTOGRAMMETRIC PRODUCTS & SERVICES**

THIS AGREEMENT dated the 17th day of January 2019 is made between Boone County, Missouri, a political subdivision of the State of Missouri through the Boone County Commission, herein "County" and **Surdex Corporation**, herein "Vendor."

IN CONSIDERATION of the parties performance of the respective obligations contained herein, the parties agree as follows:

1. **Contract Documents** - This agreement shall consist of this Purchase Agreement for Photogrammetric Products & Services, Project Assessment Quotation (PAQ) Request number **48-16NOV18**, State of Missouri Contract CS170285002 as amended, the Vendor's proposal response dated November 15, 2018, clarification dated November 19, 2018, the Round #2 to PAQ Request #48-16NOV18 response dated December 14, 2018, and e-mail clarification dated 11/19/2018 and 12/11/2018 as executed and sent by **Tim Donze** on behalf of the Vendor. All such documents shall constitute the contract documents which are incorporated herein by reference. Service or product data, specification and literature submitted with the proposal response may be permanently maintained in the County Purchasing Office contract file for this proposal if not attached. In the event of conflict between any of the foregoing documents this Purchase Agreement, Project Assessment Quotation (PAQ) Request number **48-16NOV18**, and the State of Missouri Contract CS170285002 as amended, prevail and control over the Vendor's proposal response.

2. **Purchase** – Part One, Scenario Four Orthophotography 6" Resolution for the following named counties: Boone County, Chariton County, Howard County, and Moniteau County shall be awarded for a total project area of 2,349 square miles. Included in the award is 4.8 square miles of 3" Resolution Orthophotography for the University of Missouri. The per square mile pricing presented in Part One, Option Two is also awarded. Also included in the award is Part Two, Option 1, 0.7M County LIDAR – bare earth and hydro flatten to USGS specification for Boone County that includes the University of Missouri campus.

Pursuant to paragraph 1.3 of PAQ Request 48-16NOV18, each participating entity will be making its individual award. Each entity shall write its own separate agreement with Surdex Corporation based on pricing submitted to PAQ Request # 48-16NOV18 and including Round #2. Surdex Corporation shall invoice each entity separately; each entity shall be responsible for paying Surdex Corporation directly.

This is the **Boone County** award which shall be priced as follows:

- Item 4.2.5: \$70.00 per square mile, firm and fixed applied to a total flight area for Boone County of 691 miles;
- Total firm and fixed price for Orthophotography for Boone County: \$48,370.00 which shall include Color-IR (item 4.2.4.4) and Ground Control (item 4.2.4.5) at no additional charge;
- Item 4.2.4.6 for digital file format MrSID photomosaic: \$500.00 per mosaic after the first mosaic which is provided free of charge;
- Item 4.2.6 for LiDAR at \$120,000.00, firm and fixed.

3. **Delivery** – Vendor agrees to deliver products and/or services no later than six (6) months after imagery collection and as otherwise specified in the Vendor's response (see Boone Co. 2019 Project Schedule). Delivery shall be to the Boone County GIS Department, Attn: Nathan Mattox, 801 E. Walnut, Rm. 220, Columbia, MO 65201.

4. **Billing and Payment** - All billing for Boone County shall be invoiced to the Boone County GIS Department and billings may only include the prices listed in the vendor's proposal response. No additional fees for labor or taxes shall be included as additional charges in excess of the charges in the Vendor's proposal response to the specifications. The County agrees to pay all invoices within thirty days of receipt. In the event of a billing dispute, the County reserves the right to withhold payment on the disputed amount; in the event the billing dispute is resolved in favor of the Vendor,

the County agrees to pay interest at a rate of 9% per annum on disputed amounts withheld commencing from the last date that payment was due.

5. **Binding Effect** - This agreement shall be binding upon the parties hereto and their successors and assigns for so long as this agreement remains in full force and effect.

6. **Entire Agreement** - This agreement constitutes the entire agreement between the parties and supersedes any prior negotiations, written or verbal, and any other bid or bid specification or contractual agreement. This agreement may only be amended by a signed writing executed with the same formality as this agreement.

7. **Termination** - This agreement may be terminated by the County upon thirty days advance written notice for any of the following reasons or under any of the following circumstances:

- a. County may terminate this agreement due to material breach of any term or condition of this agreement, or
- b. County may terminate this agreement if in the opinion of the Boone County Commission if delivery of products are delayed or products delivered are not in conformity with bidding specifications or variances authorized by County, or
- c. If appropriations are not made available and budgeted for any calendar year.

IN WITNESS WHEREOF the parties through their duly authorized representatives have executed this agreement on the day and year first above written.

SURDEX CORPORATION

DocuSigned by:
 by Ronald C Hoffmann
 A19894F22E6742B...
 title President

BOONE COUNTY, MISSOURI

by: Boone County Commission
 DocuSigned by:
Daniel K. Atwill
 Daniel K. Atwill, Presiding Commissioner

APPROVED AS TO FORM:

DocuSigned by:
Ron Sweet
 County Counselor

ATTEST:

DocuSigned by:
Brianna L Lennon by MT
 Brianna L Lennon, County Clerk

In accordance with RSMo 50.660, I hereby certify that a sufficient unencumbered appropriation balance exists and is available to satisfy the obligation(s) arising from this contract. (Note: Certification of this contract is not required if the terms of this contract do not create a measurable county obligation at this time.)

DocuSigned by:
Jane Pitchford, by Caryn Ginter
 Signature

1/11/2019
 Date

2010-71100 - \$168,870.00
 Appropriation Account

STANDARD CONTRACT TERMS AND CONDITIONS - BOONE COUNTY, MISSOURI

1. Contractor shall comply with all applicable federal, state, and local laws and failure to do so, in County's sole discretion, shall give County the right to terminate this Contract.
2. Prices shall include all charges for packing, delivery, installation, etc., (unless otherwise specified) to the Boone County Department.
3. The Boone County Commission has the right to accept or reject any part or parts of all bids, to waive technicalities, and to accept the offer the County Commission considers the most advantageous to the County. Boone County reserves the right to award this bid on an item-by-item basis, or an "all or none" basis, whichever is in the best interest of the County. The Purchasing Director reserves the right, when only one bid has been received by the bid closing date, to delay the opening of bids to another date and time in order to revise specifications and/or establish further competition for the commodity or service required. The one (1) bid received will be retained unopened until the new Closing date, or at request of bidder, returned unopened for re-submittal at the new date and time of bid closing.
4. When products or materials of any particular producer or manufacturer are mentioned in our contracts, such products or materials are intended to be descriptive of type or quality and not restricted to those mentioned.
5. Do not include Federal Excise Tax or Sales and Use Taxes in billing, as law exempts the County from them.
6. The delivery date shall be stated in definite terms.
7. The County Commission reserves the right to cancel all or any part of orders if delivery is not made or work is not started as guaranteed. In case of delay, the Contractor must notify the Purchasing Department.
8. In case of default by the Contractor, the County of Boone will procure the articles or services from other sources and hold the Contractor responsible for any excess cost occasioned thereby.
9. Failure to deliver as guaranteed may disqualify Contractor from future bidding.
10. Prices must be as stated in units of quantity specified, and must be firm.
11. The County of Boone, Missouri expressly denies responsibility for, or ownership of any item purchased until same is delivered to the County and is accepted by the County.
12. The County reserves the right to award to one or multiple respondents. The County also reserves the right to not award any item or group of items if the services can be obtained from a state or other governmental entities contract under more favorable terms. The resulting contract will be considered "Non-Exclusive". The County reserves the right to purchase advertising from other vendors.
13. The County, from time to time, uses federal grant funds for the procurement of goods and services. Accordingly, the provider of goods and/or services shall comply with federal laws, rules and regulations applicable to the funds used by the County for said procurement, and contract clauses required by the federal government in such circumstances are incorporated herein by reference. These clauses can generally be found in the Federal Transit Administration's Best Practices

Procurement Manual – Appendix A. Any questions regarding the applicability of federal clauses to a particular bid should be directed to the Purchasing Department prior to bid opening.

14. In the event of a discrepancy between a unit price and an extended line item price, the unit price shall govern.
15. Should an audit of Contractor's invoices during the term of the Agreement, and any renewals thereof, indicate that the County has remitted payment on invoices that constitute an over-charging to the County above the pricing terms agreed to herein, the Contractor shall issue a refund check to the County for any over-charges within 30-days of being notified of the same.
16. **For all titled vehicles and equipment the dealer must use the actual delivery date to the County** on all transfer documents including the Certificate of Origin (COO,) Manufacturer's Statement of Origin (MSO,) Bill of Sale (BOS,) and Application for Title.
17. **Equipment and serial and model numbers** - The contractor is strongly encouraged to include equipment serial and model numbers for all amounts invoiced to the County. If equipment serial and model numbers are not provided on the face of the invoice, such information may be required by the County before issuing payment.

SCENARIO FOUR PRICING - FOR BOONE COUNTY, THE UNIVERSITY OF MISSOURI, HOWARD COUNTY, COOPER COUNTY, CHARITON COUNTY, AND MONITEAU COUNTY - 6" RESOLUTION IN ALL COUNTIES AND 3" RESOLUTION FOR THE UNIVERSITY OF MISSOURI AREA IN BOONE COUNTY

Item 4.2.4 – Orthophotography (See Attachment 4)

Option One: Orthophoto Regional Flight – Total Mileage – Price to Total Mileage Shown

4.2.4.1a	Cost for 4.8 sqmi - 3" Color Orthophotography	\$ 6,000.00
4.2.4.2a.	Cost for 2,349 sqmi - 6" Color Orthophotography	\$164,430.00
4.2.4.3a.	Total	\$170,430.00

4.2.4.4. Color-IR: Included

4.2.4.5. Ground control targets: Included

4.2.4.6. Optional digital file format MrSID photomosaic: The first mosaic is free, then for each additional mosaic the price is \$500.00/each.

4.2.5 Orthophotography Pricing - Continued

OPTION 2 – Per Square Mile Matrix - Alternate to Total Mileage Pricing – Price per each square mile for the indicated mileage at the indicated resolution

Item Number	Flight Range:	Resolution
	Total Square Miles	6"
4.2.5.1	30 to 100	\$150.00 per sq mile
4.2.5.2	101 to 800	\$100.00 per sq mile
4.2.5.3	801 to 2000	\$80.00 per sq mile
4.2.5.4	2001 to 4000	\$70.00 per square mile
4.2.5.5	4001+	\$70.00 per square mile

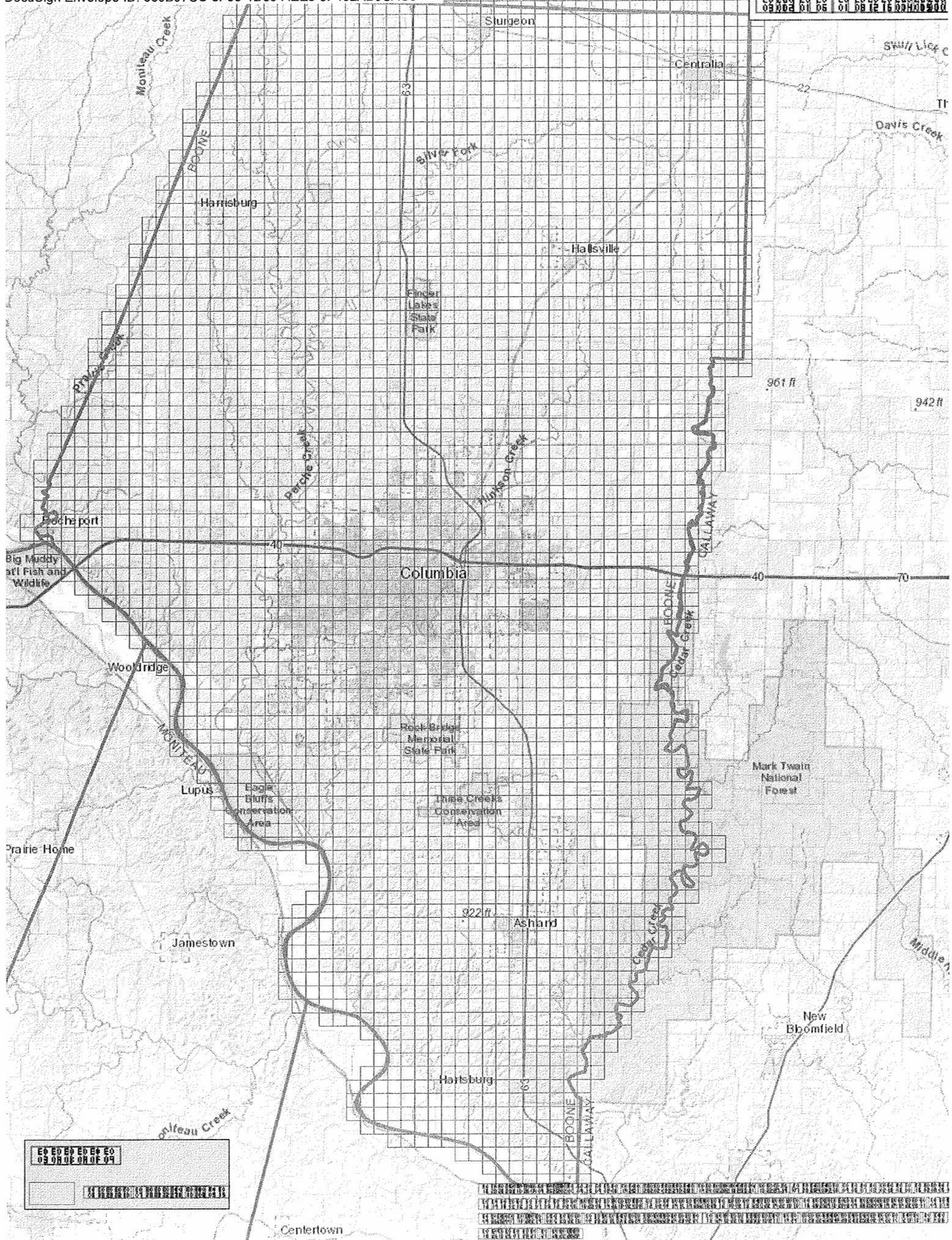
PART TWO – LiDAR PRODUCT

Item 4.2.6 – LiDAR

4.2.6.1. OPTION 1 – Classifying Bare-Earth LiDAR: County-wide Flight and Processing (See Attachment 5)

4.2.6.1a.	Cost for 690 sqmi- 0.7m County LiDAR (bare earth and hydro flatten to USGS spec)	\$120,000.00
4.2.6.1b.	Other Additional Costs	N/A
4.2.6.1c.	Total .7m County LiDAR	\$120,000.00

Document End

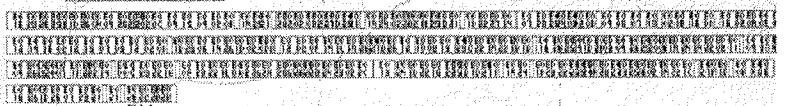
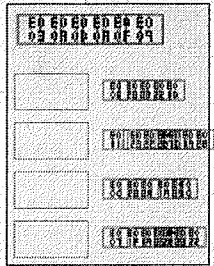
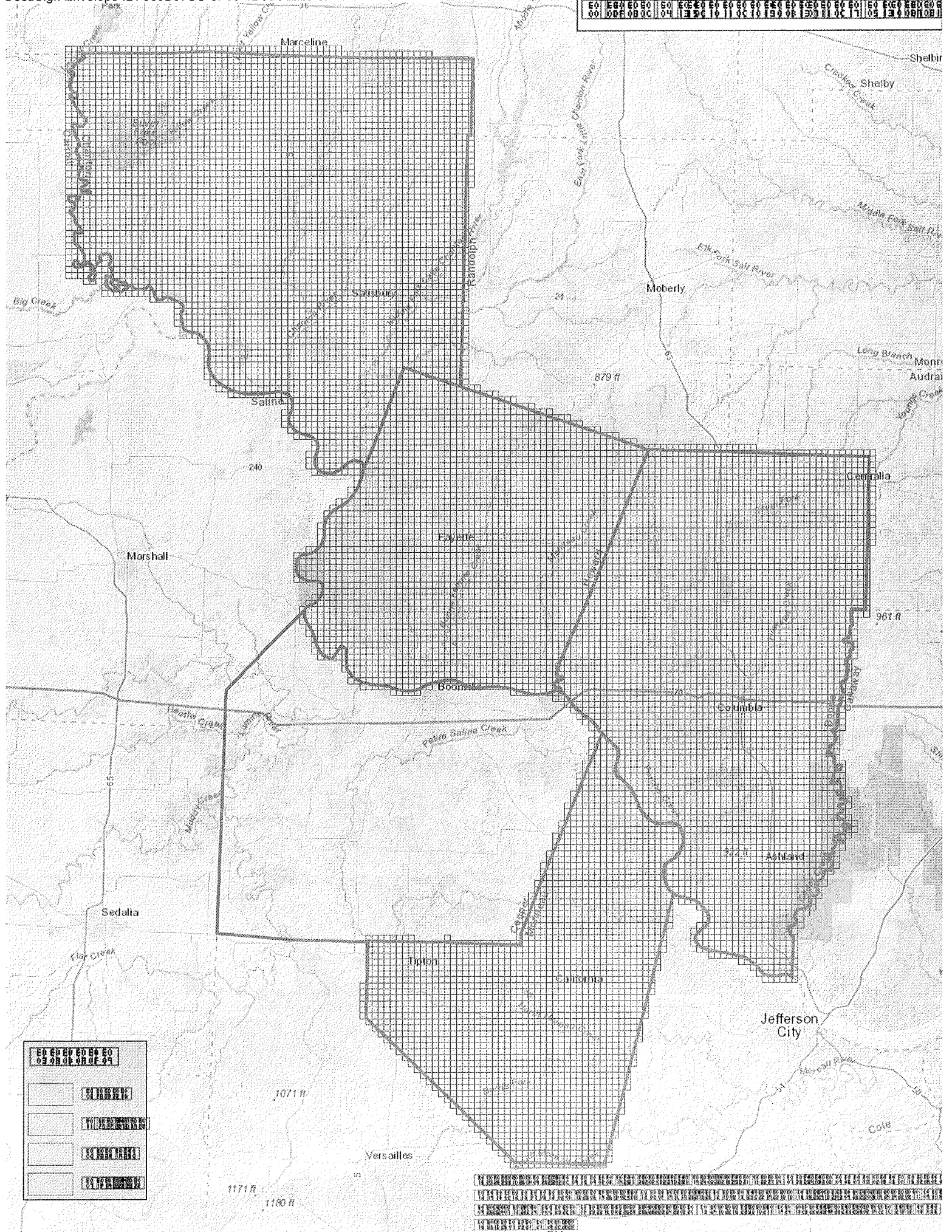
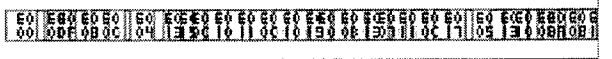


09 09 09 01 06 01 09 12 15 00 00 00 00

09 09 09 01 06 01 09 12 15 00 00 00 00

09 09 09 01 06 01 09 12 15 00 00 00 00

09 09 09 01 06 01 09 12 15 00 00 00 00





**Round #2 to PAQ Request #48-16NOV18
Photogrammetric Mapping Products and Services**

Boone County Purchasing

613 E. Ash Street, Room 109

Columbia, MO 65201

Liz Palazzolo, Senior Buyer

Phone: (573) 886-4392 - Fax: (573) 886-4390

Email: lpalazzolo@boonecountymmo.org

BOONE COUNTY, MISSOURI

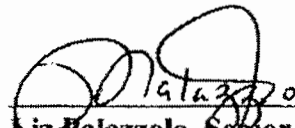
Round #2 to PAQ Request #48-16NOV18 for Photogrammetric Mapping Products and Services

Round #1 - Issued December 12, 2018

- 1) **ADD** the attached PAQ Request 48-16NOV18 -Round #2 Pricing Pages for the Orthophotography Product.

This is issued in accordance with the Request for Project Quote Assessment #48-16NOV 18 paragraph 1.4 and is hereby incorporated into and made a part of the vendors PAQ Response. The vendor shall indicate acknowledgement by signing below:

By:


 Liz Palazzolo, Senior Buyer
 Boone County Purchasing

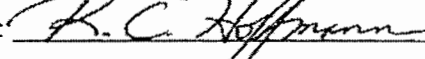
The vendor has examined **Round #2 to Request for PAQ #48-16NOV18- Photogrammetric Mapping Products and Services**, receipt of which is hereby acknowledged:

Company Name: Surdex Corporation

Address: 520 Spirit of St. Louis Blvd. Chesterfield, MO 63005

Phone Number: 636-368-4400 Fax Number: 636-368-4401

E-mail: TimD@surdex.com

Authorized Representative Signature:  Date: 12/14/2018

Authorized Representative Printed Name: Ronald C. Hoffmann

PAQ Request 48-16NOV18 – Round#2 Pricing Pages

12/12/18

SCENARIO FOUR PRICING - FOR BOONE COUNTY, THE UNIVERSITY OF MISSOURI, HOWARD COUNTY, COOPER COUNTY, CHARITON COUNTY, AND MONITEAU COUNTY – 6" RESOLUTION IN ALL COUNTIES AND 3" RESOLUTION FOR THE UNIVERSITY OF MISSOURI AREA IN BOONE COUNTY

Item 4.2.4 – Orthophotography (See Attachment 4)**Option One: Orthophoto Regional Flight – Total Mileage – Price to Total Mileage Shown**

4.2.4.1a	Cost for 4.8 sqmi - 3" Color Orthophotography	\$ 6,000
4.2.4.2a.	Cost for 3,142 sqmi - 6" Color Orthophotography	\$ 219,000
4.2.4.3a.	Total	\$ 225,000

If the vendor's projected flight area for the total contiguous area is different than the above, please indicate what the total area flight area is: 3,053

If the vendor's pricing changes as a result of pricing to actual flight area projections made by the vendor, then re-submit pricing above only as based on the vendor's flight area projections:

4.2.4.1b.	Cost for 4.8 sqmi - 3" Color Orthophotography	\$ 6,000
4.2.4.2b.	Cost for <u>3,053</u> sqmi (Vendor to identify) - 6" Color Orthophotography	\$ 213,500
4.2.4.3b.	Total	\$ 219,500

4.2.4.4. Color-IR (Identify Cost Below Per PAQ Participant Or Check Here if Cost Identified Below is the Same for All Participants: X);

Color IR - Cost is included in the ortho pricing above.

4.2.4.5. Ground control targets (Identify Cost Below Per PAQ Participant Or Check Here if Cost Identified Below is the Same for All Participants: X);

Ground control cost is included in the ortho pricing above.

4.2.4.6. Optional digital file format MrSID photomosaic (Identify Cost Below Per PAQ Participant Or Check Here if Cost Identified Below is the Same for All Participants: X);

The first Mosaic is free, then for each additional mosaic \$500 per.

4.2.4.7. Other Costs (Identify Cost Below Per PAQ Participant Or Check Here if Cost Identified Below is the Same for All Participants: X);

Not applicable.

4.2.5 Orthophotography Pricing - Continued

OPTION 2 –Per Square Mile Matrix - Alternate to Total Mileage Pricing – Price per each square mile for the indicated mileage at the indicated resolution

Item Number	Flight Range: Total Square Miles	Resolution 6"
4.2.5.1	30 to 100	\$150
4.2.5.2	101 to 800	\$100
4.2.5.3	801 to 2000	\$80
4.2.5.4	2001 to 4000	\$70
4.2.5.5	4001+	\$70

4.2.5.6 **Other costs** associated with per mile pricing that will be charged:

N/A

Document End

Liz Palazzolo

From: Tim Donze <timd@surdex.com>
Sent: Friday, December 14, 2018 2:55 PM
To: Liz Palazzolo
Subject: RE: Request from Boone County - Aerial Photogrammetry - Round #2 PAQ Request 48-16NOV18
Attachments: Round #2 PAQ Request 48-16NOV18_Surdex.pdf

Liz,

Attached is our reply to your recent request.

As reference here is how we calculated the revised number of square miles:

	Sq Miles
Boone	691
Howard	472
Cooper	569
Moniteau	419
Chariton	767
County Total	2918
Boone Electric	135
Total	3053

Tim Donze
Cell: (314) 422-7616
TimD@surdex.com

HELP US PREVENT PAYMENT FRAUD – Surdex will adhere to the original payment processing method in our contract. Surdex will not contact you to change payment processing methods. Surdex requests all questions or concerns be directed to Surdex Corporation, Accounting.

From: Liz Palazzolo <LPalazzolo@boonecountymmo.org>
Sent: Wednesday, December 12, 2018 10:13 AM
To: Tim Donze <timd@surdex.com>
Subject: RE: Request from Boone County - Aerial Photogrammetry - Round #2 PAQ Request 48-16NOV18

Thank you

Liz Palazzolo
Senior Buyer
Boone County Purchasing
Phone: 573-886-4392
Fax: 573-886-4390
613 E. Ash, Room 109
Columbia, MO 65201

From: Tim Donze <timd@surdex.com>
Sent: Wednesday, December 12, 2018 10:01 AM

To: Liz Palazzolo <LPalazzolo@boonecountymmo.org>

Subject: RE: Request from Boone County - Aerial Photogrammetry - Round #2 PAQ Request 48-16NOV18

Thank you Liz. We should be able to return this within your timeframe, noon on the 18th.

Tim Donze

Cell: (314) 422-7616

TimD@surdex.com

HELP US PREVENT PAYMENT FRAUD – Surdex will adhere to the original payment processing method in our contract. Surdex will not contact you to change payment processing methods. Surdex requests all questions or concerns be directed to Surdex Corporation, Accounting.

From: Liz Palazzolo <LPalazzolo@boonecountymmo.org>

Sent: Wednesday, December 12, 2018 9:56 AM

To: Tim Donze <timd@surdex.com>

Subject: Request from Boone County - Aerial Photogrammetry - Round #2 PAQ Request 48-16NOV18

Importance: High

Good morning: Boone County is requesting a second round of pricing for the orthography product with the provision that it has been settled that a 3"/6" resolution is wanted. I've attached additional pricing pages for your submission assuming a contiguous flight area that includes the Counties of Boone, Howard, Cooper, Chariton and Moniteau, as well as the University of Missouri.

As a matter of clarification, the County is interested in knowing if your pricing is based on what your company foresees as the total flight area to complete the project assuming all Counties participate, versus the square mileage that was published in the PAQ Request. Related, did the mileage represented in the State of Missouri's RFP (Attachment 2 of RFP530034901700285) for Boone, Cooper, Chariton, Moniteau and Howard Counties impact any of your pricing assumptions in your PAQ Response?

The attached additional pricing pages attempt to help resolve the above questions. Please sign the cover page and return it with the requested additional pricing, and feel free to provide whatever additional detail/information may aid us in the evaluation of your PAQ Response.

The Round #2 response is due by Noon on 12/18/19 – please confirm that this time works for you because I realize that we are working in the holiday season, and schedules are busy. Thank you and let me know if you have any questions.

Liz Palazzolo

Senior Buyer

Boone County Purchasing

Phone: 573-886-4392

Fax: 573-886-4390

613 E. Ash, Room 109

Columbia, MO 65201

Liz Palazzolo

From: Tim Donze <timd@surdex.com>
Sent: Tuesday, December 11, 2018 2:46 PM
To: Liz Palazzolo
Subject: RE: Question - Request for PAQ #48-16NOV8 Boone County et al. for Aerial Photogrammetry Services

Liz,

Thanks for the note.

We appreciate your inquiry about financing for one or two of your partners. We are willing to attempt to negotiate something mutually agreeable. That said, we do not know the options on the scopes of work to be selected and the final amount that we would be financing.

I thought I'd start with explaining our typical payment schedule, then an option for consideration.

Typical Surdex timeline and billing cycle for an orthoimagery project

Acquiring the new imagery is a significant portion of our project cost, so we usually invoice 60% of the project cost after acquisition. Acquisition is usually in March to early April, so the invoice for 60% is usually sent by the end of April or so.

Upon delivery of the imagery, Surdex will invoice 30% with the client keeping a 10% retaining until they give final acceptance of the data. On a multi-county project like this I'd estimate the data to be delivery around September 1st with final acceptance and final payment in October or so.

Surdex is willing to offer an extended payment schedule to help bridge into the funding of a new fiscal year

Surdex can reduce the first invoice to 50% of the project which will be invoiced after acquisition is complete, around the end of April.

Surdex can offer to hold off invoicing the other 50% of the project cost until after the first of the year or as late as April first of 2020.

Note: This is a good faith offer in hopes of easing the fiscal burden for some of your partners. If there are unique circumstances that we are not aware of, we have an open mind and are willing to discuss further.

Something to consider

The aerial imagery firm that often offers 3 year financing is not selling an apples to apples product as ours and they also are not working under the same business model as Surdex.

The firm offering the 3 year financing package is selling a licensed set of data and their agreement is for 3 years. The firm is reusing the data for a separate line of business which provides a second revenue stream. The counties are actually helping them fund the imagery acquisition for their secondary line of business as much as the firm is helping the county with financing.

Surdex is producing this data for Boone County and their partners custom for them and it is 100% your data when we are complete. We do not resell your data or have additional revenue streams from it.

Tim Donze

Cell: (314) 422-7616

TimD@surdex.com

HELP US PREVENT PAYMENT FRAUD – Surdex will adhere to the original payment processing method in our contract. Surdex will not contact you to change payment processing methods. Surdex requests all questions or concerns be directed to Surdex Corporation, Accounting.

From: Liz Palazzolo <LPalazzolo@boonecountymmo.org>

Sent: Tuesday, December 11, 2018 12:18 PM

To: Tim Donze <timd@surdex.com>

Subject: Question - Request for PAQ #48-16NOV8 Boone County et al. for Aerial Photogrammetry Services

Good afternoon: If any of the participants were to request the ability to finance their portion of the work your company does, is financing payment over two fiscal years (24 months) without interest possible for that entity? One, perhaps two participants have expressed an interest in a no-interest financing option for their portion of flight/work-product costs.

Would financing over 36-months be possible, again no interest?

Please elaborate and explain how this would work if financing is an option. Thank you

Liz Palazzolo

Senior Buyer

Boone County Purchasing

Phone: 573-886-4392

Fax: 573-886-4390

613 E. Ash, Room 109

Columbia, MO 65201

Liz Palazzolo

From: Tim Donze <timd@surdex.com>
Sent: Monday, November 19, 2018 4:19 PM
To: Liz Palazzolo
Cc: Lorie Thomas; Nathan Mattox
Subject: RE: Request for Clarification - Request for PAQ Aerial Photogrammetric Mapping Products and Services
Attachments: Surdex_Proposal_48-16NOV18_CS170285001-004_PAQ Request edit page 13.pdf

Liz,

Actually we did find one other typo that we should correct for accuracy.

This page edits page 13,

The correction is: 4.2.6.c. Total **10PPM** MU LiDAR
From the previous version of: 4.2.6.c. Total **.10PPM**

Tim Donze
Cell: (314) 422-7616
TimD@surdex.com

HELP US PREVENT PAYMENT FRAUD – Surdex will adhere to the original payment processing method in our contract. Surdex will not contact you to change payment processing methods. Surdex requests all questions or concerns be directed to Surdex Corporation, Accounting.

From: Liz Palazzolo <LPalazzolo@boonecountymo.org>
Sent: Monday, November 19, 2018 3:33 PM
To: Tim Donze <timd@surdex.com>
Cc: Lorie Thomas <loriet@surdex.com>; Nathan Mattox <NMattox@boonecountymo.org>
Subject: RE: Request for Clarification - Request for PAQ Aerial Photogrammetric Mapping Products and Services

Thanks – I did a quick check on the other scenarios and I believe this was the only change made comparing your response to the PAQ request. Please let me know otherwise.

Liz Palazzolo
Senior Buyer
Boone County Purchasing
Phone: 573-886-4392
Fax: 573-886-4390
613 E. Ash, Room 109
Columbia, MO 65201

From: Tim Donze <timd@surdex.com>
Sent: Monday, November 19, 2018 3:23 PM
To: Liz Palazzolo <LPalazzolo@boonecountymo.org>
Cc: Lorie Thomas <loriet@surdex.com>; Nathan Mattox <NMattox@boonecountymo.org>
Subject: RE: Request for Clarification - Request for PAQ Aerial Photogrammetric Mapping Products and Services

Liz,

Thank you for the note. Yes, we have a typo on 4.2.3.3. Thank you for catching this and the opportunity to correct it.

Our typo is in the description of the resolution. The correction changes 9" to 12" resolution for that scenario. This correction now matches your PAQ language.

Surdex has corrected the item 4.2.3.3 in the following attachment. The correction is made to this item and it should read:

- item 4.2.3.3 (Part One, Scenario Three for the "Cost for 2,334 sq mi – 12" Color Orthography" which is quoted at **\$63,000.00**).

If this does not fully clarify things, let me know.

Tim Donze
Cell: (314) 422-7616
TimD@surdex.com

HELP US PREVENT PAYMENT FRAUD – Surdex will adhere to the original payment processing method in our contract. Surdex will not contact you to change payment processing methods. Surdex requests all questions or concerns be directed to Surdex Corporation, Accounting.

From: Liz Palazzolo <LPalazzolo@boonecountymo.org>
Sent: Monday, November 19, 2018 1:19 PM
To: Tim Donze <timd@surdex.com>
Cc: Lorie Thomas <loriet@surdex.com>; Nathan Mattox <NMattox@boonecountymo.org>
Subject: Request for Clarification - Request for PAQ Aerial Photogrammetric Mapping Products and Services
Importance: High

Good afternoon: Thank you for responding to Request #48-16NOV18 for the Project Assessment Quotation for Boone County et al.

Please clarify the price for item 4.2.2.3 (Part One, Scenario Two pricing for the "Cost for 2,334 sqmi – 9" Color Orthography" which is quoted as **\$126,000.00**) and item 4.2.3.3 (Part One, Scenario Three for the "Cost for 2,334 sqmi – 9" Color Orthography" which is quoted at **\$63,000.00**). It would appear that the two should be the same price since the service is the same, but in the interests of clarity, the County is requesting that Surdex address the two prices as a matter of clarification. If there is a need to correct the quotation for either line item, please indicate which price is the correct/intended price. Also, if indicating the correct price impacts any other related "totals" pricing, please indicate the correct total price.

Please let me know if this request is not clear. Thank you

Liz Palazzolo
Senior Buyer
Boone County Purchasing
Phone: 573-886-4392
Fax: 573-886-4390
613 E. Ash, Room 109
Columbia, MO 65201



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

Photogrammetric Mapping Products & Services

<u>OPTION 2 – Classifying Bare-Earth LiDAR: University of Missouri (See Attachment 6)</u>	
4.2.6.2.	
4.2.6.2a.	Cost for 4.8 sqmi – 0.7m LiDAR over campus (Point Cloud (all points returned), bare earth and hydro flatten to USGS spec) \$ <u>12,000</u>
4.2.6.2b.	Other Additional Cost _____ \$ <u>0</u>
4.2.6.2c.	Total .7m MU LiDAR \$ <u>12,000</u>

<u>OPTION 3 – Classifying Bare-Earth LiDAR: University of Missouri (See Attachment 7)</u>	
4.2.6.3.	
4.2.6.3a.	Cost for 4.8 sqmi – 4PPM QL2 LiDAR over campus (Point Cloud (all points returned), bare earth and hydro flatten to USGS spec) \$ <u>13,500</u>
4.2.6.3b.	Other Additional Cost _____ \$ <u>0</u>
4.2.6.3c.	Total 4PPM – QL2 MU LiDAR \$ <u>13,500</u>

<u>OPTION 4 – Classifying Bare-Earth LiDAR: University of Missouri (See Attachment 8)</u>	
4.2.6.4.	
4.2.6.4a.	Cost for 4.8 sqmi – 10PPM QL1 LiDAR over campus (Point Cloud (all points returned), bare earth and hydro flatten to USGS spec) \$ <u>15,000</u>
4.2.6.4b.	Other Additional Cost _____ \$ <u>0</u>
4.2.6.4c.	Total 10PPM MU LiDAR \$ <u>15,000</u>

PART THREE – TOPOGRAPHICS AND PLANIMETRICS

4.2.7.	TOPOGRAPHIC AND PLANIMETRICS (See Attachment 9)
4.2.7.1.	Cost for 4.8 sqmi Campus New 2' Contours (Attachment 8) \$ <u>2,500</u>
4.2.7.2.	Cost for 4.8 sqmi Roofline Elevations for MU Campus \$ <u>4,000</u>
4.2.7.3.	Other cost associated with topographics and planimetrics that will be charged:

Item 4.2.7.1. is based on LiDAR being part of the final scope of work.

Liz Palazzolo

From: Tim Donze <timd@surdex.com>
Sent: Monday, November 19, 2018 3:23 PM
To: Liz Palazzolo
Cc: Lorie Thomas; Nathan Mattox
Subject: RE: Request for Clarification - Request for PAQ Aerial Photogrammetric Mapping Products and Services
Attachments: Surdex_Proposal_48-16NOV18_CS1AQ Request_Page_10_Revision.pdf

Liz,

Thank you for the note. Yes, we have a typo on 4.2.3.3. Thank you for catching this and the opportunity to correct it.

Our typo is in the description of the resolution. The correction changes 9" to 12" resolution for that scenario. This correction now matches your PAQ language.

Surdex has corrected the item 4.2.3.3 in the following attachment. The correction is made to this item and it should read:

- item 4.2.3.3 (Part One, Scenario Three for the "Cost for 2,334 sq mi – 12" Color Orthography" which is quoted at **\$63,000.00**).

If this does not fully clarify things, let me know.

Tim Donze
Cell: (314) 422-7616
TimD@surdex.com

HELP US PREVENT PAYMENT FRAUD – Surdex will adhere to the original payment processing method in our contract. Surdex will not contact you to change payment processing methods. Surdex requests all questions or concerns be directed to Surdex Corporation, Accounting.

From: Liz Palazzolo <LPalazzolo@boonecountymo.org>
Sent: Monday, November 19, 2018 1:19 PM
To: Tim Donze <timd@surdex.com>
Cc: Lorie Thomas <loriet@surdex.com>; Nathan Mattox <NMattox@boonecountymo.org>
Subject: Request for Clarification - Request for PAQ Aerial Photogrammetric Mapping Products and Services
Importance: High

Good afternoon: Thank you for responding to Request #48-16NOV18 for the Project Assessment Quotation for Boone County et al.

Please clarify the price for item 4.2.2.3 (Part One, Scenario Two pricing for the "Cost for 2,334 sqmi – 9" Color Orthography" which is quoted as **\$126,000.00**) and item 4.2.3.3 (Part One, Scenario Three for the "Cost for 2,334 sqmi – 9" Color Orthography" which is quoted at **\$63,000.00**). It would appear that the two should be the same price since the service is the same, but in the interests of clarity, the County is requesting that Surdex address the two prices as a matter of clarification. If there is a need to correct the quotation for either line item, please indicate which price is the correct/intended price. Also, if indicating the correct price impacts any other related "totals" pricing, please indicate the correct total price.

Please let me know if this request is not clear. Thank you

Liz Palazzolo

Senior Buyer

Boone County Purchasing

Phone: 573-886-4392

Fax: 573-886-4390

613 E. Ash, Room 109

Columbia, MO 65201

**PROPOSAL**

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

- 4.2.2.8. Other Cost (Identify Cost Below Per PAQ Participant Or Check Here if Cost Identified Below is the Same for All Participants: X)

Not applicable.

SCENARIO THREE PRICING - FOR BOONE COUNTY, THE UNIVERSITY OF MISSOURI, HOWARD COUNTY AND COOPER COUNTY - LOW RESOLUTION

Item 4.2.3 - Orthophotography (See Attachment 3)

Option One: Orthophoto Regional Flight - Total Mileage

4.2.3.1.	Cost for 4.8 sqmi - 3" Color Orthophotography	\$	<u>6,000</u>
4.2.3.2a.	Cost for 808 sqmi - 6" Color Orthophotography	\$	<u>68,500</u>
	Or		
4.2.3.2b.	Cost for 943 sqmi - 6" Color Orthophotography - Additional area is contiguous to Boone County	\$	<u>80,000</u>
4.2.3.3.	Cost for 2,334 sqmi - 12" Color Orthophotography	\$	<u>63,000</u>
4.2.3.4a	Total	\$	<u>137,500</u>
4.2.3.4b.	Total with additional area	\$	<u>149,000</u>

- 4.2.3.5. Color-IR (Identify Cost Below Per PAQ Participant Or Check Here if Cost Identified Below is the Same for All Participants: X)

Color-IR cost is included in the ortho pricing above.

- 4.2.3.6. Ground control targets (Identify Cost Below Per PAQ Participant Or Check Here if Cost Identified Below is the Same for All Participants: X)

Ground Control cost is included in the ortho pricing above.

- 4.2.3.7. Optional digital file formats MrSID photomosaic
(Identify Cost Below Per PAQ Participant Or Check Here if Cost Identified Below is the Same for All Participants: X)

The first Mosaic is free, then for each additional mosaic \$500 per.

- 4.2.3.8. Other Cost (Identify Cost Below Per PAQ Participant Or Check Here if Cost Identified Below is the Same for All Participants: X)

Not applicable.

Liz Palazzolo

From: Liz Palazzolo
Sent: Monday, November 19, 2018 1:19 PM
To: Tim Donze
Cc: 'Lorie Thomas'; Nathan Mattox
Subject: Request for Clarification - Request for PAQ Aerial Photogrammetric Mapping Products and Services

Importance: High

Tracking:	Recipient	Delivery
	Tim Donze	
	'Lorie Thomas'	
	Nathan Mattox	Delivered: 11/19/2018 1:19 PM

Good afternoon: Thank you for responding to Request #48-16NOV18 for the Project Assessment Quotation for Boone County et al.

Please clarify the price for item 4.2.2.3 (Part One, Scenario Two pricing for the "Cost for 2,334 sqmi – 9" Color Orthography" which is quoted as **\$126,000.00**) and item 4.2.3.3 (Part One, Scenario Three for the "Cost for 2,334 sqmi – 9" Color Orthography" which is quoted at **\$63,000.00**). It would appear that the two should be the same price since the service is the same, but in the interests of clarity, the County is requesting that Surdex address the two prices as a matter of clarification. If there is a need to correct the quotation for either line item, please indicate which price is the correct/intended price. Also, if indicating the correct price impacts any other related "totals" pricing, please indicate the correct total price.

Please let me know if this request is not clear. Thank you

Liz Palazzolo

Senior Buyer

Boone County Purchasing

Phone: 573-886-4392

Fax: 573-886-4390

613 E. Ash, Room 109

Columbia, MO 65201

PROPOSAL



E-mail Submission: lpalazzolo@boonecountvmo.org

Request for Proposal

#48-16NOV18 - PROJECT ASSESSMENT QUOTATION (PAQ)

STATE OF MISSOURI CONTRACTS CS170285001-004 FOR PHOTOGRAMMETRIC MAPPING PRODUCTS & SERVICES

Submittal Deadline: 11-16-2018, 2:00 P.M. CST

Submitted To: Boone County Purchasing Department

613 E. Ash Street, Room 109
Columbia, Missouri 65201-4460
Tel: (573) 886-4392

Submitted By: Surdex Corporation

Selection Contact: Tim Donze

Vice President, Business Development
Direct: (314) 422-7616 | Office: (636) 368-4424
E-mail: timd@surdex.com
520 Spirit of St. Louis Blvd.
Chesterfield, MO 63305

www.surdex.com



PROPOSAL

48-16NOV18 PAQ | CS170285001-0104 CONTRACTS
Photogrammetric Mapping Products & Services

This page left blank.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

Photogrammetric Mapping Products & Services

Table of Contents

TABLE OF CONTENTS	3
COVER LETTER	5
PAO RESPONSE/PRICING PAGE	7
4.1 PAQ Response Page	7
4.2 Pricing.....	8
PART ONE - ORTHOPHOTOGRAPHY PRODUCT	8
PART TWO - LIDAR PRODUCT	12
PART THREE – TOPOGRAPHICS AND PLANIMETRICS	13
ALL OTHER COSTS:	14
4.8 Additional Charges / Alternate Deliverables (if any).....	14
OTHER PAQ RESPONSE DETAILS:	14
5.1 Delivery Dates	14
5.2 Project Contact.....	16
5.3 Experience and Reliability	16
5.3.1 Company History	16
5.3.2 Vendor References	19
Proposed Subcontractors.....	22
5.4 Hardware and Software Including Equipment and Materials.....	23
5.5 Expertise of Vendor's Personnel	25
1. Personnel Summary.....	25
2. Resumes of Surdex Key Staff	26
5.6 Other	33
1. What Distinguishes Surdex	33
2. Project Management	34
3. Communication for Multi-Participant Projects.....	35
PROPOSED METHOD OF PERFORMANCE	35
PART 1: ORTHOPHOTOGRAPHY	35
A. Aerial Acquisition Operations.....	36
1. Aircraft.....	37
2. Sensor: The Leica ADS100 Digital Pushbroom Camera	37
B. Project Design	40
1. Imagery Flight Design	40
2. Ground Survey Design	41
3. Acquisition Effort.....	42
C. Airborne Imagery Acquisition.....	42
D. Imagery Inspection.....	44
E. Aerotriangulation.....	45
F. Field Control Survey Operations.....	47
G. Digital Elevation Model (DEM) Update/Edit	48
H. Pilot Project.....	48
I. Digital Orthoimagery Processing	49
1. Image Processing Approach.....	49
2. Orthorectification	51
3. Mosaicking.....	51
J. Accuracy Validation.....	54
K. Orthoimagery Quality Control Systems.....	54
L. Surdex's Imagery Preview Service	56
M. Surdex's Web-Based Inspection Tool (SurCheckSM).....	57
PART TWO: LIDAR ACQUISITION & PROCESSING	64
A. Project Design	64



PROPOSAL
48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

- 1. Sensor: Teledyne Optech Galaxy LiDAR Sensor 65
- 2. LiDAR Ground Survey..... 67
- 3. Sensor Calibration..... 67
- B. Acquisition..... 68**
 - 1. Post-Acquisition Data Verification..... 68
 - 2. Processing Approach 69
 - 3. Boresighting..... 69
 - 4. Post Processing..... 70
 - 5. Point Cloud Classification 70
- C. Hydro Processing..... 71**
 - 1. Create Digital Surface Model (DSM) 72
 - 2. Create Bare-Earth DEM..... 73
 - 3. Final QC and Accuracy Checks 73
- PART THREE: TOPOGRAPHICS / PLANIMETRICS..... 75**
 - A. Topographic Mapping..... 75**
 - B. Planimetric Mapping (Roofline Elevations)..... 77**
- FORMS AND CERTIFICATIONS..... 78**
 - WORK AUTHORIZATION CERTIFICATION 78**
 - Last page of the E-Verify Memorandum of Understanding 79
 - Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion Lower Tier Covered Transactions* 80
 - Licenses, Certifications, Accreditation, and/or Permits 81*
 - Certificate of Good Standing 81



Cover Letter

November 16, 2018

Liz Palazzolo
Senior Buyer
Boone County Purchasing Department
613 E. Ash Street, Room 109
Columbia, Missouri 65201-4460

Dear Ms. Palazzolo:

On behalf of our Team, Surdex is pleased to provide this fully-compliant response to the Project Assessment Quotation "#48-16NOV18 PAQ, County of Boone, Missouri" under the State of Missouri Contract CS170285001-004, Photogrammetric Products and Services.

Surdex brings numerous advantages to this project:

- Our Chesterfield, Missouri headquarters is less than 100 miles from the project area, providing quick response for field and aerial acquisition operations, as well as availability to our staff and facilities at any point during the project.
- Only US Labor will be used on this project. Nearly all of the acquisition and processing will be performed with Missouri labor, bolstering the State's employment and tax base.
- We have performed numerous projects in the State of Missouri at the State, Federal, and Local government level and are familiar with weather conditions and ground cover. This includes the Boone County and Partners project in 2015.
- Our state-of-the-art Leica ADS100 digital pushbroom cameras are ideally suited for orthoimagery projects as well as planimetric and topographic mapping. Surdex's five ADS100 systems will be available for your project. These are the same cameras used on your 2015 project.
- Newly added since our last project is a new feature that gives access through a web service to provide early access to preliminary orthoimagery. This data will not be perfect, but it will allow the partners the ability to use the imagery within weeks of completing flight vs waiting for final delivery to begin using the imagery.
- We have provided LiDAR acquisition and processing for large areas of the State of Missouri over the last several years and bring the necessary expertise to perform on this project. We have upgraded our LiDAR systems to the Optek Galaxies since 2015 and look forward to updating and improving the quality of your elevation data. As LiDAR technology improves, so does the data we produce with it.
- We bring more than sufficient resource capacity to acquire and process the orthoimagery, LiDAR, planimetric, and topographic products for this project.
- We have a wealth of experience in "doing the job right" and have a strong reputation for delivering successful projects on time and providing superior customer service in the process.
- We treat our clients as partners, allowing us to overcome unexpected challenges by keeping our clients in the loop at all times to ensure issues are resolved in an efficient and wise manner.
- For ground survey operations, our Team includes two firms identified on our Missouri State contract: EFK and David Mason & Associates of St. Louis (MoDOT Certified DBE).



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Surdex provides a high level of technical detail in our proposal responses so that our clients are able to assess our design and technical approach. In the case of this response, some portions of our proposal are general in nature due to a variety of options that can be selected by the Mid-Missouri partners.

- The LiDAR portion of the project has several options in terms of area and product scope and our response is thorough.
- Topographic contours are less defined and dependent upon the options selected by Mid-Missouri partners. For example, contours can be done from new LiDAR acquisition if this option is selected, but would have to be done photogrammetrically if the LiDAR option is not selected.
- Planimetric mapping (building heights) scopes are still to be determined to some degree and our treatment of these is general in nature.

Once the final project scope is more defined and the options known, Surdex would be glad to provide more detail in our methodology. Similarly, regarding delivery dates, we have given our best estimate on realistic delivery dates. The options selected for the final scope of work will likely affect the delivery dates. For instance, if LiDAR is selected, we will want to delay ortho production for the LiDAR areas to produce the new DEM before producing orthos. We will work with the partners during final scoping of the project to optimize the delivery schedule. We will do our best to work with your needs and priorities to make this a successful endeavor for everyone.

Surdex can support individual contracts written for each participating partner, if required. Surdex often has regional projects executed in this manner with more than a dozen potential partners. We also will continue to help identify and support additional potential partners joining your consortium.

We have placed a number of samples of orthoimages and LiDAR data on our ftp site for use by the reviewers of this submission. The details for the login are below. Please note that the login and password are case-sensitive.

Site: <ftp.surdex.net>

User: Boone

Pwd: Sdx2018

If you have any questions or comments, do not hesitate to contact me directly at any point in the evaluation process.

Sincerely,

SURDEX CORPORATION

A handwritten signature in black ink, appearing to read "Tim Donze", is written over the printed name.

Tim Donze

Vice President Business Development, Midwest Region

Direct Tel: 314-422-7616

Email: TimD@surdex.com



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

PAO Response/Pricing Page



4.1 PAQ RESPONSE PAGE

In compliance with this PAQ Request and subject to all the conditions thereof, the PAQ Respondent agrees to furnish the services/equipment/supplies requested and proposed and certifies he/she has read, understands, and agrees to all terms, conditions, and requirements of this quotation and is authorized to contract on behalf of the Respondent named below. (Note: This form must be signed. All signatures must be original).


Company Name: Surdex Corporation

Address: 520 Spirit of St. Louis Blvd.
Chesterfield, MO 63005

Telephone: (636) 368-4400 Fax: (636) 368-4401

Federal Tax ID (or Social Security#) 43-0690641

Print Name: Ronald C. Hoffmann Title: President

Signature:  Date: November 15, 2018

E-Mail Address: RonHCorp@surdex.com



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

4.2 PRICING

Pricing - Provide firm, fixed pricing as indicated on this response form to conduct photogrammetric services as outlined in Attachments One through Nine and in compliance with State of Missouri contracts CSI 70285001 through CSI 70285004, and the terms of this PAQ request.

If necessary, please attach a more detailed listing outlining all costs to perform photogrammetric services. As appropriate, items should include professional fees, materials, out of pocket expenses, sub-consultant fees and any other costs.

All pricing shall be considered firm and fixed. No other costs shall be paid to the contractor if not quoted and clearly identified in the PAQ response.

There are three parts to this PAQ Request: Part One is for Orthophotography; Part Two is for a LiDAR product; and Part Three is for a Topographies and Planimetrics product. PAQ respondents must respond to all three parts.

PART ONE - ORTHOPHOTOGRAPHYPRODUCT

SCENARIO ONE PRICING: BOONE COUNTY AND THE UNIVERSITY OF MISSOURI ONLY

Item 4.2.1 - Orthophotography (See Attachment 1)

Option One: Orthophoto Regional Flight - Total Mileage

4.2.1.1.	Cost for 4.8 sqmi - 3" Color Orthophotography	\$	<u>6,000</u>
4.2.1.2a	Cost for 746 sqmi - 6" Color Orthophotography	\$	<u>63,000</u>
	Or		
4.2.1.2b.	Cost for 881 sqmi - 6" Color Orthophotography - Additional area is contiguous to Boone County	\$	<u>74,000</u>
4.2.1.3a	Total	\$	<u>69,000</u>
4.2.1.3b.	Total with additional area	\$	<u>80,000</u>

4.2.1.4 Color-IR Option (Identify Cost Below Per PAQ Participant **Or** Check Here if Cost Identified Below is the Same for All Participants: X)

Color-IR cost is included in the ortho pricing above.

4.2.1.5 Ground control targets (Identify Cost Below Per PAQ Participant **Or** Check Here if Cost Identified Below is the Same for All Participants: _____)

Ground Control cost is included in the ortho pricing above.

**PROPOSAL**

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

Photogrammetric Mapping Products & Services

- 4.2.1.6 Optional digital file format MrSID photomosaic
(Identify Cost Below Per PAQ Participant Or Check Here if Cost Identified Below is the
the
Same for All Participants: X)

The first Mosaic is free, then for each additional mosaic \$500 per.

- 4.2.1.7 Other Cost (Identify Cost Below Per PAQ Participant Or Check Here if
Cost Identified Below is the Same for All Participants: X)

Not applicable.

**SCENARIO TWO PRICING - FOR BOONE COUNTY, THE UNIVERSITY OF MISSOURI,
CHARITON COUNTY, COOPER COUNTY, HOWARD COUNTY AND MONITEAU
COUNTY - HIGH RESOLUTION**

Item 4.2.2 - Orthophotography (See Attachment 3)

Option One: Orthophoto Regional Flight - Total Mileage

4.2.2.1.	Cost for 65.6 sqmi - 3" Color Orthophotography	\$	<u>26,000</u>
4.2.2.2a.	Cost for 746 sqmi - 6" Color Orthophotography	\$	<u>63,000</u>
	<u>Or</u>		
4.2.2.2b.	Cost for 881 sqmi - 6" Color Orthophotography - Additional area is contiguous to Boone County	\$	<u>74,000</u>
4.2.2.3.	Cost for 2,334 sqmi - 9" Color Orthophotography	\$	<u>126,000</u>
4.2.2.4a	Total	\$	<u>215,000</u>
4.2.2.4b.	Total with additional area	\$	<u>226,000</u>

- 4.2.2.5. Color-IR (Identify Cost Below Per PAQ Participant Or Check Here if
Cost Identified Below is the Same for All Participants: X)

Color-IR cost is included in the ortho pricing above.

- 4.2.2.6. Ground control targets (Identify Cost Below Per PAQ Participant Or Check Here if
Cost Identified Below is the Same for All Participants: X)

Ground Control cost is included in the ortho pricing above.

- 4.2.2.7. Optional digital file formats MrSID photomosaic
(Identify Cost Below Per PAQ Participant Or Check Here if
Cost Identified Below is the Same for All Participants: X)

The first Mosaic is free, then for each additional mosaic \$500 per.

**PROPOSAL**

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

- 4.2.2.8. Other Cost (Identify Cost Below Per PAQ Participant Or Check Here if Cost Identified Below is the Same for All Participants: X)

Not applicable.

SCENARIO THREE PRICING - FOR BOONE COUNTY, THE UNIVERSITY OF MISSOURI, HOWARD COUNTY AND COOPER COUNTY - LOW RESOLUTION

Item 4.2.3 - Orthophotography (See Attachment 3)

Option One: Orthophoto Regional Flight - Total Mileage

4.2.3.1.	Cost for 4.8 sqmi - 3" Color Orthophotography	\$ <u>6,000</u>
4.2.3.2a.	Cost for 808 sqmi - 6" Color Orthophotography	\$ <u>68,500</u>
	Or	
4.2.3.2b.	Cost for 943 sqmi - 6" Color Orthophotography - Additional area is contiguous to Boone County	\$ <u>80,000</u>
4.2.3.3.	Cost for 2,334 sqmi - 9" Color Orthophotography	\$ <u>63,000</u>
4.2.3.4a	Total	\$ <u>137,500</u>
4.2.3.4b.	Total with additional area	\$ <u>149,000</u>

- 4.2.3.5. Color-IR (Identify Cost Below Per PAQ Participant Or Check Here if Cost Identified Below is the Same for All Participants: X)

Color-IR cost is included in the ortho pricing above.

- 4.2.3.6. Ground control targets (Identify Cost Below Per PAQ Participant Or Check Here if Cost Identified Below is the Same for All Participants: X)

Ground Control cost is included in the ortho pricing above.

- 4.2.3.7. Optional digital file formats MrSID photomosaic
(Identify Cost Below Per PAQ Participant Or Check Here if
Cost Identified Below is the Same for All Participants: X)

The first Mosaic is free, then for each additional mosaic \$500 per.

- 4.2.3.8. Other Cost (Identify Cost Below Per PAQ Participant Or Check Here if Cost Identified Below is the Same for All Participants: X)

Not applicable.

**PROPOSAL**

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

**SCENARIO FOUR PRICING - FOR BOONE COUNTY, THE UNIVERSITY OF
MISSOURI, HOWARD COUNTY AND COOPER COUNTY - 6" RESOLUTION IN ALL
COUNTIES**

Item 4.2.4 - Orthophotography (See Attachment 4)

Option One: Orthophoto Regional Flight - Total Mileage

4.2.4.1.	Cost for 4.8 sqmi - 3" Color Orthophotography	\$	<u>6,000</u>
4.2.4.2a.	Cost for 3142 sqmi - 6" Color Orthophotography	\$	<u>219,000</u>
	Or		
4.2.4.2b.	Cost for 3277 sqmi - 6" Color Orthophotography - Additional area is contiguous to Boone County	\$	<u>229,000</u>
4.2.4.3a	Total	\$	<u>225,000</u>
4.2.4.3b.	Total with additional area	\$	<u>235,000</u>

4.2.4.4. Color-IR (Identify Cost Below Per PAQ Participant Or Check Here if
Cost Identified Below is the Same for All Participants: X)

Color-IR cost is included in the ortho pricing above.

4.2.4.5. Ground control targets (Identify Cost Below Per PAQ Participant Or Check Here if
Cost Identified Below is the Same for All Participants: X)

Ground Control cost is included in the ortho pricing above.

4.2.4.6. Optional digital file formats MrSID photomosaic
(Identify Cost Below Per PAQ Participant Or Check Here if
Cost Identified Below is the Same for All Participants: X)

The first Mosaic is free, then for each additional mosaic \$500 per.

4.2.4.7. Other Cost (Identify Cost Below Per PAQ Participant Or Check Here if
Cost Identified Below is the Same for All Participants: X)

Not applicable.

**PROPOSAL**

48-16NOV18 PAQ | C5170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

4.2.5 Orthophotography Pricing – Continued

OPTION 2 – Per Square Mile Matrix - Alternate to Total Mileage Pricing – Price per each square mile for the indicated mileage at the indicated resolution.

Item Number	Flight Range Total Square Miles	Resolution 3"	Resolution 6"	Resolution 9"	Resolution 12"
4.2.5.1	30 to 100	400	150	100	50
4.2.5.2	101 - to 800	300	100	68	35
4.2.5.3	801 to 2000	255	85	62	29
4.2.5.4	2001 to 4000	240	80	59	27
4.2.5.5	4001+	225	75	51	25

4.2.5.6 Other Cost associates with per mile pricing that will be charged:

None

PART TWO - LIDAR PRODUCT**Item 4.2.6 - LiDAR**

4.2.6.1. **OPTION 1 – Classifying Bare-Earth LiDAR: County-wide Flight and Processing (See Attachment 5)**

4.2.6.1a.	Cost for 690 sqmi – 0.7m County LiDAR (bare earth and hydro flatten to USGS spec)	\$	<u>120,000</u>
4.2.6.1b.	Other Additional Cost _____	\$	<u>0</u>
4.2.6.1c.	Total .7m County LiDAR	\$	<u>120,000</u>



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

Photogrammetric Mapping Products & Services

OPTION 2 – Classifying Bare-Earth LiDAR: University of Missouri (See Attachment 6)

4.2.6.2.			
4.2.6.2a.	Cost for 4.8 sqmi – 0.7m LiDAR over campus (Point Cloud (all points returned), bare earth and hydro flatten to USGS spec)	\$	<u>12,000</u>
4.2.6.2b.	Other Additional Cost _____	\$	<u>0</u>
4.2.6.2c.	Total .7m MU LiDAR	\$	<u>12,000</u>

OPTION 3 – Classifying Bare-Earth LiDAR: University of Missouri (See Attachment 7)

4.2.6.3.			
4.2.6.3a.	Cost for 4.8 sqmi – 4PPM QL2 LiDAR over campus (Point Cloud (all points returned), bare earth and hydro flatten to USGS spec)	\$	<u>13,500</u>
4.2.6.3b.	Other Additional Cost _____	\$	<u>0</u>
4.2.6.3c.	Total 4PPM – QL2 MU LiDAR	\$	<u>13,500</u>

OPTION 4 – Classifying Bare-Earth LiDAR: University of Missouri (See Attachment 8)

4.2.6.4.			
4.2.6.4a.	Cost for 4.8 sqmi – 10PPM QL1 LiDAR over campus (Point Cloud (all points returned), bare earth and hydro flatten to USGS spec)	\$	<u>15,000</u>
4.2.6.4b.	Other Additional Cost _____	\$	<u>0</u>
4.2.6.4c.	Total .10PPM MU LiDAR	\$	<u>15,000</u>

PART THREE – TOPOGRAPHICS AND PLANIMETRICS

4.2.7. TOPOGRAPHIC AND PLANIMETRICS (See Attachment 9)

4.2.7.1.	Cost for 4.8 sqmi Campus New 2' Contours (Attachment 8)	\$	<u>2,500</u>
4.2.7.2.	Cost for 4.8 sqmi Roofline Elevations for MU Campus	\$	<u>4,000</u>
4.2.7.3.	Other cost associated with topographics and planimetrics that will be charged:		

Item 4.2.7.1. is based on LiDAR being part of the final scope of work.

**PROPOSAL**

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

Photogrammetric Mapping Products & Services

ALL OTHER COSTS:**4.8 ADDITIONAL CHARGES / ALTERNATE DELIVERABLES (IF ANY)**

Regardless of product, identify any other required additional charges below. Attach supporting documentation to help explain the costs. As necessary, if charges a specific charge applies only per certain county/entity or if it is an across-the-board standard rate for the regional flight area. The PAQ Respondent has the option to introduce alternate deliverables here and to price them accordingly:

_____	\$	_____ 0
_____	\$	_____ 0
_____	\$	_____ 0
4.8.1	Total Additional Charges	\$ _____ 0

Other PAQ Response Details:**5.1 DELIVERY DATES**

5.1.1 Estimated total number of planes used for flight(s):

Ortho: 3 LiDAR: 2

5.1.2 Estimated calendar date(s) of flight(s): _____

Ortho: 2/1/19 – 3/31/19 LiDAR: 2/1/19 – 3/31/19 5.1.3 Estimated days to complete Orthophotography Product /Delivery to Participating Entity: 122 Calendar Days5.1.4 Estimated days to complete LiDAR Product /Delivery to Participating Entity: 60 Calendar Days5.1.5 Estimated days to complete Topographies and Planimetrics /Building Elevations Product (MU)/Delivery to Participating Entity: 16 Calendar Days



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

The following is a representative overview of the project schedule based on the following scenarios. The actual schedule will be determined based on your selected options.

- Ortho Schedule is based off of Scenario 4 (1.8.2.1) – 6” orthos for all participating counties
- LiDAR Schedule is based off of Scenario 1 (1.8.2.2) – QL2 LiDAR over entire Boone Co.

Boone Co. 2019 Project Schedule		
Production Task	Start Date	End Date
Orthophotography		
Flight Acquisition	February 1, 2019	March 31, 2019
Early Access Prelim Orthos**	April 30, 2019	
Survey Control	February 1, 2019	February 15, 2019
Aerotriangulation	March 15, 2019	April 15, 2019
Ortho Production	April 15, 2019	August 15, 2019
Ortho Pilot Deliverables**	May 15, 2019	
Client Review	August 15, 2019	September 15, 2019
Final Deliverables	September 15, 2019	October 15, 2019
LiDAR - Boone QL2		
Flight Acquisition	January 15, 2019	March 31, 2019
LiDAR Production	April 1, 2019	May 30, 2019
Pilot Deliverables**	May 1, 2019	
Client Review	May 31, 2019	June 29, 2019
Final Deliverables	July 1, 2019	July 30, 2019
Mapping - MU Campus		
Planimetric Mapping Production	April 16, 2019	May 1, 2019
Client Review	May 2, 2019	May 17, 2019
Final Deliverables	May 18, 2019	May 31, 2019



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

5.2 PROJECT CONTACT

If different than the contact provided on the first page of the PAQ Response page, provide a project contact person who will be responsible for coordinating the efforts and personnel of all parties involved in the response, to include, but not be limited to, oral presentations, demonstrations, site visits and responses to request for clarification, if any. Provide the following:

Name: Tim Donze

Address: 520 Spirit of St. Louis Blvd., Chesterfield, MO 63005

E-mail: TimD@surdex.com

Phone Number: (314) 422-7616 direct or (636) 368-4424 desk or (636) 368-4400 main office

Fax: (636) 368-4401

Hours of Availability: 8 am to 7 pm.

5.3 EXPERIENCE AND RELIABILITY

The evaluation of the vendor's proposed experience and reliability will be subjective based on the ability of the vendor to perform the requirements stated herein. Therefore, the vendor should present detailed information regarding their experience and reliability. The following information should be provided by the vendor in order to assist Boone County in the evaluation of the vendor's experience and reliability. The County reserves the right to use this information, including information gained from any other source, in the evaluation process.

Failure to submit requested information may negatively impact the evaluation of the proposal. The County is under no obligation to obtain information from the vendor not submitted with the proposal that may impact the subjective evaluation of the vendor's proposal.

5.3.1 Company History

The vendor should describe in the available space the company's background in provision of photogrammetric services, e.g., when the company was founded, how long the company has been serving the national and Missouri markets, etc.:

Surdex is one of the premier aerial mapping companies in the United States, under continuous operation by the same ownership since 1954. Our headquarters and production facility are based in the greater metropolitan St. Louis, Missouri, area. Over the last decade we have grown from a regional company to a nationwide presence, including projects in Canada and Mexico. Approximately 100 employees work at our headquarters building and hangar complex at the Spirit of St. Louis Airport in Chesterfield, Missouri. Our clientele includes federal, state, and local government as well as private engineering, defense mapping, and Homeland Security.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Surdex Company Details	
Detail	Information
Company Name	Surdex Corporation
Business Address and Production location	520 Spirit of St. Louis Blvd. Chesterfield, MO 63005-1002 United States
Website	www.surdex.com
Year Established	Est. 1954, Missouri
Company Organization	Surdex is a privately held S-Corporation, owned by the same family members since its formation in 1954.
Phone / Facsimile	(636) 368-4400 / (636) 368-4401
Industries Served	Governments (federal, state, county, municipal), private engineering, transportation, and energy

Surdex brings a depth of equipment and experienced staff to the table.

Surdex's Features and Benefits	
Feature	Benefit
In continuous operation under the same ownership for over 60 years.	Demonstrated staying power, assuring clients of the company's financial stability and proven commitment to success. We have a proven focus on assessing and investing in technology.
A base of leadership and experience exemplified by an extremely high retention rate. Our senior staff averages over 25 years of experience at Surdex and within the profession.	Our staff's extensive experience enables us to quickly and easily resolve issues – as well as the foresight to anticipate and prevent many of them.
Our staff has numerous certifications in surveying and photogrammetry.	Certified professional knowledge and achievement that assures our clients of professionalism.
A strong dedication to project management and client interaction.	We involve our clients as true partners and emphasize communication and information to ensure successful projects.
Aggressive research and development effort to improve performance, accuracy, and quality.	Demonstrated embracing of new technology and solutions to provide the highest quality services to our client base.
Fleet of 10 aircraft supported by FAA-certified inspection, maintenance, and repair.	Vast acquisition capacity addressing all types of aerial acquisition. Our in-house maintenance, inspection, and repair staff ensure the maximum availability of these key assets.

Surdex has a strong background in both prime contracting and subcontracting to other companies in the geospatial data and services realm.

Surdex's Geospatial Data Services	
Service	Benefit
Aerial data acquisition with film and digital imaging sensors as well as LIDAR.	Foundation for digital orthoimagery, planimetric mapping, and topographic mapping.
Surdex's customized digital orthoimagery production line is exemplified by performance and quality.	Highest possible quality products and schedule assurance.
LIDAR data acquisition and processing for bare earth and hydro-enforced elevation models, classifications, and contours.	Full service topographic mapping and value-added LIDAR products to address any requirements.
Stereocompilation equipment and software for topographic modeling and planimetric mapping.	Accurate and high-quality mapping.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

Photogrammetric Mapping Products & Services

Our success can be attributed to our:

- **Robust Quality Control Measures:** Building upon achieving ISO Certification for specific geospatial products for the National Geospatial-Intelligence Agency, Surdex has instituted ISO processes internally to optimize our quality control and efficiencies. This provides an exceptionally high level of first-time client acceptance (98.8%) and adherence to schedules (on-time delivery rate of 96.7%).
- **Experienced and skilled staff:** our senior staff averages 25 years of experience, and our technicians average 9 years. We have over 15 Registered Land Surveyors and/or ASPRS Certified Photogrammetrists, and a number of these have advanced degrees.
- **Aerial sensors:** Surdex has eight large-format digital imagery sensors (five Leica ADS100s, three Leica DMC-1s), six Leica RCD30 medium format digital sensors configurable as separate or oblique (five head or three head), two film cameras, and three Teledyne Optech Galaxy LiDAR sensors.
- **Aerial acquisition:** Surdex boasts a fleet of ten Cessna aircraft supported by our own FAA-certified for inspection, maintenance, and repair to ensure maximum availability. Our premier imagery acquisition aircraft are our four twin-turbine Cessna 441 (Conquest), which can operate up to 35,000' and cruise at over 300 knots. They can ferry from our home base to any of the lower 48 states within 6 hours, allowing us to take advantage of good weather.
- **Digital Orthoimagery:** Surdex's processing environment consists of a significant amount of customized software coupled with open source and 3rd party software. Processing is tied into an Enterprise database with comprehensive status tracking and a high degree of task automation. Processing is performed in a distributed processing environment under a common user interface allowing easy cross-training. The software supports all standard file formats such as TIFF, GeoTIFF, MrSID, JPEG, and JPEG2000.
- **Extensive experience:** Surdex has been awarded, through competitive processes, projects of all sizes throughout the nation, including the 275,000 square mile statewide digital orthoimagery project for the State of Texas, over 7 million square miles of orthoimagery for the USDA National Agriculture Imagery Program (NAIP) since 2002, existing contracts with the Army Corps of Engineers, a current USGS GPSC contract, and numerous repeat state and local government and private clients.
- **Web-Based Client Product Inspection Tool:** Our SurCheckSM online inspection tool streamlines the inspection, remedial action, and acceptance process and has been in use for over five years. It has been proven to simplify and reduce overall project timelines.
- **Ground Control Surveys:** Surdex performs ground control surveys all over the country with RTK GPS systems and geodetic grade GPS equipment.
- **IT infrastructure:** We have over 2.1 PB of digital storage with over 100 processors, supported by a dedicated generator to assure ongoing production in the event of power disruption. All interim and final data is backed up to LT06 tape on rigorous cycles, ensuring speedy recovery and de-archiving.
- **R&D:** Surdex continuously investigates and integrates new hardware and software technology as well as processes. The focus of the R&D staff is to optimize throughput, quality, and accuracy.
- **Planimetric and Topographic Mapping:** Stereo compilation of planimetric and topographic mapping is performed on analytical plotters and softcopy photogrammetric workstations.
- **LiDAR Processing:** We process all LiDAR data using commercial software products produced and custom software tools developed by Surdex.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

5.3.2 Vendor References

The offeror should provide at minimum two references below regarding provision of photogrammetric services similar to what is being requested by this PAQ request:

Reference 1:

Company/Entity Name: Mid-America Regional Council (MARC)

Contact Name: Jakob Goldman

Contact's Title: GIS Specialist

City: Kansas City, MO 64105

Telephone Number and Area Code (816) 701-8307

Email Address: jgoldman@marc.org

Description of Equipment/Services Furnished The description is listed below in the Project Narrative.

Availability of Reference: Yes

Project Narrative					
Surdex has worked on this project three times since 2010, covering approximately 7,400 square miles of 6" GSD imagery. To reduce building lean of tall buildings in approximately 15 square miles of urban Kansas City, Surdex densified the flight lines. The client-provided DEM was also updated and provided as a deliverable.					
Year	Sensor	GSD	≈ Sq. Mi.	Acquisition Conditions	Notes
2018	ADS100	6"	2,678	February 17 to April 10, 2018	6,150' AGL
2016	ADS100	6"	2,526	February 12-March 27, 2016 3,000' buffer past county boundaries	6,150' AGL
2010	DMC	6"	2,172	Mid-February to late March	4,800' AGL
Project Deliverables				<ul style="list-style-type: none"> 6" GSD 4-band digital orthoimagery of Kansas City metro area in GeoTIFF and MrSID format Updated DEM Metadata files by tile and county in FGDC .xml format Mosaic seamlines in ESRI format 	
Dates				January 1, 2016 through September 1, 2016	
Subcontractors				None	
Challenges				<ul style="list-style-type: none"> Project area includes both Missouri and Kansas Burning fields in Leavenworth County 	
Highlights				Acquisition at 6,150' AGL, with increased flight lines over urban areas, increasing sidelap to 55%, thereby reducing building lean	



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Reference 2:

Company/Entity Name: St. Louis County Imagery Consortium

Contact Name: Madhukar Mohan, Metropolitan St. Louis Sewer District (MSD)

Contact's Title: GIS Manager

City: St. Louis, MO 63139

Telephone Number and Area Code (314) 768-2735

Email Address: MMohan@stlmsd.com

Description of Equipment/Services Furnished The description is listed below in the Project Narrative.

Availability of Reference: Yes

Project Narrative

Surdex has undertaken this project twice in the past three years for a total of approximately 1,850 square miles. In 2018, Surdex acquired 1,181 square miles of 6" GSD imagery using the ADS100 sensor (we also acquired imagery in St. Charles County, which provided additional project area). In 2016, Surdex acquired 665 square miles of orthoimagery in St. Louis City and County. We collected the imagery using the ADS100 sensor at a resolution of 6" GSD and utilized existing control from St. Louis County and the surface from a Surdex LiDAR project.

Surdex has provided yearly orthoimagery for municipalities in the St. Louis region since 2010. City planners use the imagery for decision-making about everything from fixing roads to new building developments. This project is a regional collaboration between 27 St. Louis partners.

Year	Sensor	GSD	= Sq. Mi.	Acquisition Conditions
2018	ADS100	6"	1,181	Midday, late in the season
2016	ADS100	6"	665	Midday, late in the season
Project Deliverables				<ul style="list-style-type: none"> • RGB Natural Color digital orthophotos with 0.5' in GeoTIFF w/tfw and MrSID format, delivered to all partners. • Mosaic seamlines exported to ESRI shapefile. • Tile layout in ESRI shapefile format.
Dates				Late February – Early April each year
Subcontractors				N/A
Highlights				To properly collect data for St. Louis's diverse terrain, Surdex planned additional flight lines over areas with a high density of tall buildings and flew as close to midday and late in the season as possible to minimize the length of shadows.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Reference 3:

Company/Entity Name: Douglas County, KS

Contact Name: Bryce Hirschman / Dan Rose

Contact's Title: GIS Coordinator

City: Lawrence, KS 66044

Telephone Number and Area Code (785) 832-5190

Email Address: bhirschman@douglascountyks.org

Description of Equipment/Services Furnished The description is listed below in the Project Narrative.

Availability of Reference: Yes

Project Narrative				
This project was a buyup for the 2017 State of Kansas project. Surdex flew and processed the imagery. The project encompassed Douglas, Shawnee and Jefferson counties.				
Year	Sensor	GSD	= Sq. Mi.	Acquisition Conditions
2017	ADS100	6"	1,588	Late Spring, leaf off
Project Deliverables				<ul style="list-style-type: none"> 6" GSD 3-and digital orthoimagery Tiff imagery MrSID mosaics for each county MrSID mosaics for Topeka and Lawrence
Dates				Flown mid-February to late March 2/2018 - 10/2018
Highlights				<ul style="list-style-type: none"> Buyup component for the 2017 State of Kansas project. Monitored atmospheric conditions for crops being burned in western Kansas, this can cause a thin layer of haze.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Proposed Subcontractors

Surdex will utilize one of our survey subcontractors from our State Contract for field Survey.

Subcontractors	
Proposed Subcontractor (Name and Address)	Service Proposed to be Provided by the Proposed Subcontractor
David Mason & Associates 800 South Vandeventer St. Louis, MO 63110	Field survey
EFK Moen 13523 Barrett Parkway, Suite 250 St. Louis, MO 63021	Field survey





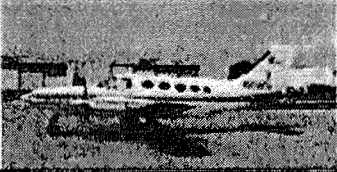

PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

5.4 HARDWARE AND SOFTWARE INCLUDING EQUIPMENT AND MATERIALS

Identify in the available space the all hardware, software, equipment materials and supplies that will be used to conduct requested photogrammetric mapping services (orthophotography, LiDAR, topographies and planimetrics):

Surdex Corporation is a full-service photogrammetric firm. As such, we own and operate all the equipment necessary to process remotely sensed geospatial data. The following is a list of equipment owned and operated by Surdex Corporation.

Surdex's Acquisition Aircraft			
Number, Make and Model of Aircraft	Category	Specifications	Image
(4) Cessna 441 Conquest II-10 (with RVSM*)	Twin-Turbine Pressurized	Flight Range: 2,193 nm Altitude: 1,200 - 35,000 AGL Certified Altitude: 35,000 MSL Cruise Speed: ~310 knots	
(1) Cessna 414A Chancellor III	Twin-Piston Pressurized	Flight Range: 900 nm Altitude: 1,200 - 25,000 AGL Certified Altitude: 30,200 MSL Cruise Speed: ~235 knots	
(1) Cessna 335 II	Twin-Piston	Flight Range: 928 nm Altitude: 1,200 - 18,000 AGL Certified Altitude: 26,800 MSL Cruise Speed: ~215 knots	
(4) Cessna TU-206F Turbo Stationair	Single-Engine	Flight Range: 720 nm Altitude: 1,000 - 10,000 AGL Certified Altitude: 26,300 MSL Cruise Speed: ~148 knots	

* RVSM: Reduced Vertical Separation Module. This FAA-certified equipment allows operation above 28,000' (MSL).

Surdex's Image Sensors				
Sensor Make/Model	Serial #	Purchase Date	Calibration Date	IMU Make
Leica ADS100	10510	12/27/2012	06/21/2013	SPAN uIRS
	10515	12/27/2012	07/02/2013	
	10522	12/12/2013	12/16/2013	
	10531	05/14/2014	6/12/2014	
	10552	03/31/2016	04/30/2015	
Leica DMC-1	146	06/24/2005	03/05/2010	IGI AEROCtrl-11e
	148	06/22/2006	05/27/2009	
	149	03/22/2007	12/09/2009	



PROPOSAL
 48-16NOV18 PAQ | CS170285001-004 CONTRACTS
 Photogrammetric Mapping Products & Services

Surdex's LIDAR Sensors				
Sensor Make/Model	Serial #	Purchase Date	Calibration Date	IMU Make
Teledyne Optech Galaxy	5060382	09/27/2016	8/2016	Applanix AP60
Teledyne Optech Galaxy	12SEN314	10/25/2016	11/23/2016	Applanix AP60
Teledyne Optech Galaxy	5060407	02/06/2018	02/23/2018	Applanix AP60

Orthoimagery and Survey Equipment & Software		
Compilation and Orthoimagery		Survey
<u>Stereo Compilation and Mapping</u> 12-Workstations 3-Summit Evolution Direct collection into Arc GIS and Microstation	<u>Map Edit/Finishing</u> 4-Workstation Computers 6-GIS Arc/INFO Workstations <u>Digital Orthoimagery and Imaging</u> 3 Tape Library Systems 2+ petabyte computer storage capacity 1000+ Core Processing Cluster 12-Workstations XPro	13-Trimble 5700 receivers 6-Trimble TSC1 data collectors running Survey Controller data collection software 1--Leica 5 TCRO3 second total station 4-Trimble R8 GNSS receivers 4-- Trimble R10 GNSS receivers 1-Trimble R8 GNSS VRS rover with TSC2 data collector running Access field data collection software 1-Trimble R8 GNSS VRS rover with TSC3 data collector running Access field data collection software 4--TOPCON HIPER IV GNSS receivers 10--CHC OPUS RS GNSS receivers with Trimble internal boards 2 -- Trimble Business Center (TBC) post processing software 2 -- Novatel Waypoint GrafNav/GrafNet GNSS post processing software CORPSCON Blue Marble Geographics GeographiCalculator 1--CHC N71 GNSS CORS base station 1 - Trimmark RTK Base radio
GIS /CADD Software	Photogrammetric Software	Surdex Enterprise Database
13-ESRI ArcGIS for Desktop 3-AutoCAD 14-Bentley MicroStation 1-GEOPAK Survey 1-GEOPAK Site 2-GEOPAK Descartes InRoads	ImageStation Aerial Triangulation (ISAT) 14-Softplotter Leica XPro	Surdex Inspection Tool Surdex Ortho Surdex Grouping Tool Client Product Acceptance Tool



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Production Storage		
System	Storage	Notes
Violin Memory StorNext shared SAN	110TB	Data currently in production. Flash memory better than 400,000 IOPS and 6,000 MB/sec throughput
Infortend StorNext SAN	1 PB	Data currently in production. Drives in a RAID6 configuration.
Windows NTFS Direct Attached Storage (DAS)	1 PB	Raw images – also backed up on LTO6 tapes. The files are distributed across 72 servers and managed by the database
Totals	2.1 PB	Does not include local workstation storage

Backup Power Generator

In the spring of 2016, Surdex installed a diesel-powered backup generator that can fully sustain all production operations in the event of the loss of power; the fuel can be replenished indefinitely. This ensures that adequate time is provided to restore power without interrupting normal operations, ensuring production schedules are maintained.

5.5 EXPERTISE OF VENDOR'S PERSONNEL

The qualifications of the personnel proposed by the vendor to perform the requirements of this RFP, whether from the vendor's organization or from a proposed subcontractor, will be subjectively evaluated. Therefore, the vendor should submit detailed information related to the experience and qualifications, including education and training, of proposed personnel who will be considered key personnel conducting photogrammetric mapping services.

Surdex believes that there is no substitute for experience. Workers' experience on previous projects, resolving difficulties and streamlining processes, enables them to apply their knowledge on your project, saving time, avoiding potential problems, and improving quality.

Surdex staff consists of 100 highly-qualified, highly-trained personnel. We also have an excellent retention rate; of our 25 people in leadership positions, they average over 25 years in the mapping profession and over 15 years employment by Surdex. This longevity equates to higher levels of experience, resulting in an extremely high level of productivity and fewer mistakes – and consequently higher adherence to schedules and quality. Our staff includes:

- 8 ASPRS Certified Photogrammetrists.
- 3 registered professionals land surveyors.
- 1 Project Management Professional (PMP) certification.

1. Personnel Summary




PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

Photogrammetric Mapping Products & Services

Key Personnel Expertise Summary		
Name	Years Exp.	Role
Project Management		
Wade Williams, CP	23	Director of Project Management – <i>ASPRS Certified Photogrammetrist</i>
Cornell Rowan, CP	34	Project Manager – <i>ASPRS Certified Photogrammetrist</i>
Survey and Control		
Steve Kasten, CP, PLS	37	Survey and Photogrammetric Engineering – <i>ASPRS Certified Photogrammetrist, Professional Land Surveyor</i>
Aerial Triangulation		
Dave Beattie, CP	20	Aerial Triangulation Specialist
Larry Stolte	33	Aerial Triangulation Specialist
Flight Operations		
Paul Briggs	30	Chief Pilot
Jason Pohlman	11	Flight Acquisition Manager
Digital Orthoimagery Production		
Colby Forke, CP	18	Director of Image Processing – <i>ASPRS Certified Photogrammetrist</i>
John Frese	24	Image Processing Leader
Aaron Garibaldi	12	Orthoimagery Production Lead
Planimetric and Topographic Mapping and Quality Assurance / Quality Control		
Brad Barker	22	Director of 3D Mapping
LIDAR Processing		
Michael Goymerac	11	LIDAR Product Leader

2. Resumes of Surdex Key Staff

WADE WILLIAMS, CP	
Director of Project Management	
<p>EXPERIENCE</p> <ul style="list-style-type: none"> ■ Surdex Corporation <ul style="list-style-type: none"> • Company: 23 years • Professional: 23 years <p>EDUCATION</p> <ul style="list-style-type: none"> ■ B.S. Geography and Cartography, Missouri State University <p>CERTIFICATION</p> <ul style="list-style-type: none"> ■ ASPRS Certified Photogrammetrist, #1290 (2006) <p>SOFTWARE PROFICIENCIES</p> <p>ESRI ArcGIS, Adobe Photoshop, Lizard Tech Geo Express, Global Mapper, Accuracy Analyst, Microstation, FileZilla FTP, Surdex GroupTool</p>	<p>PROJECT DUTIES</p> <p>With 15 years of project management experience at Surdex, Wade is one of our most experienced project managers. As the Director, he oversees the project management staff, ensuring all projects remain on schedule and all deliverables meet specifications. He provides the team leadership skills to make timely decisions based on his understanding of project initiating, planning, executing, monitor/controlling & closing phases. His knowledge of these key phases ensures the successful completion of each project.</p> <p>Wade oversees assigned projects and manages the scopes of work for various clients. He is responsible for managing in-house communications regarding all aspects of project execution including client communication, project planning, surveying, aerial imagery acquisition, image processing, aerial triangulation, LiDAR processing, planimetric/</p>
	



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

topographic feature collection and digital orthoimagery
production.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

CORNELL ROWAN, CP Project Manager

EXPERIENCE

- Surdex Corporation
 - Company: 10 years
 - Professional: 34 years

EDUCATION

- B.S. Engineering Technology, Jackson State University, Mississippi

CERTIFICATION/MEMBERSHIP

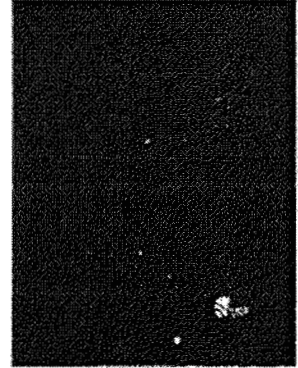
- ASPRS Certified Photogrammetrist, #1055 (1997)

SOFTWARE PROFICIENCIES

ESRI software (ArcInfo, ArcGIS and ArcView), Intergraph's MicroStation, AutoCAD, Autometric's SoftPlotter, PhotoShop and Microsoft Office

PROJECT DUTIES

Cornell oversees assigned projects and manages the scopes of work for various clients. He is responsible for managing in-house communications regarding all aspects of project execution including client communication, project planning, surveying, aerial photography acquisition, scanning, aerial triangulation, LIDAR processing, planimetric/ topographic feature collection and digital orthoimagery production.



STEVE KASTEN, CP, RLS

Senior VP, Survey / Photogrammetric Engineering

EXPERIENCE

- Surdex Corporation
 - Company: 17 years
 - Professional: 37 years

EDUCATION

- B.S. Earth Science/Cartography, Southern University Edwardsville Illinois
- M.S. Civil Engineering & Photogrammetry, Purdue University

CERTIFICATION / LICENCES

- ASPRS Certified Photogrammetrist, #1038 (1997)
- Survey Licenses:
 - Florida PSM # LS6682
 - North Carolina PLS #L-4106
 - Oregon PP #80665RPP
 - South Carolina PLS, #24303
 - Virginia SP #000119

SOFTWARE PROFICIENCIES

AutoCAD, MicroStation, Global Mapper, Trimble Business Center, Trimble Geomatics Office, Waypoint GrafNav/GrafNet, Corpscon, ISAT, Bingo, XPro, ESRI ArcGIS, IMAGINE, Agisoft Photo, Scan, Pix4D, ISite, Realworks

PROJECT DUTIES

Steve has over 35 years of experience in the fields of photogrammetric engineering application development, photogrammetric mapping, geodesy, cartography and surveying. While at Surdex, Steve has performed disparate duties that include the management of photogrammetric projects, airborne GPS survey data and triangulation. In addition to his extensive project management experience, Steve has experience providing direct photogrammetric engineering support services. He is skilled in developing algorithms for sensor modeling, post processing of GPS data, error propagation, photogrammetric data reduction, and implementing algorithms into engineering programs. Steve is a licensed professional in Survey, here is a listing of his licenses:

- Florida Professional Surveyor and Mapper License # LS6682
- North Carolina Professional Land Surveyor, #L-4106
- Oregon Professional Photogrammetrist, #80665RPP
- South Carolina Professional Photogrammetric Land Surveyor, #24303
- Virginia Surveyor Photogrammetrist, #000119



DAVE BEATTIE, CP



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Aerial Triangulation Specialist

EXPERIENCE

- Surdex Corporation
 - Company: 19 years
 - Professional: 20 years

EDUCATION

- B.S. Cartographic Sciences, Missouri State University

CERTIFICATION

- ASPRS Certified Photogrammetrist, #1417 (2009)

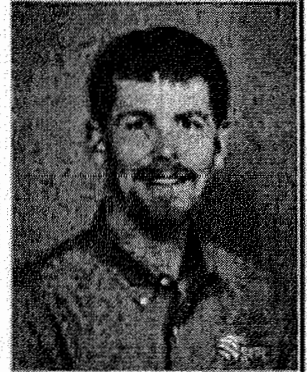
SOFTWARE PROFICIENCIES

Surdex Grouping Tool software suite, Leica XPro, ArcMap, Global Mapper, Inertial Explorer and Surdex Hydra

PROJECT DUTIES

Dave's experience ranges from sensor operation, finishing and surveying—to cost estimation. This unique combination gives him the depth of understanding required to accurately complete Surdex's aerial triangulation.

As Aerial Triangulation Specialist, Dave understands the interrelationships between flight parameters, survey layout and field crew coordination. Dave evaluates each FAAT solution, producing the final reports for QC verification and approval. His unique experience supplements his ability to precisely determine the cause of FAAT anomalies and eliminate them from future occurrences where possible.



LARRY STOLTE

Aerial Triangulation Specialist

EXPERIENCE

- Surdex Corporation
 - Company: 33 years
 - Professional: 33 years

EDUCATION

- U.S. Army Electronic School

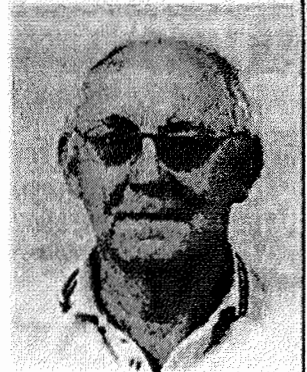
SOFTWARE PROFICIENCIES

Waypoint – GrafNet, Waypoint – GrafNav, Waypoint – Inertial Explorer, Image Station Automatic Triangulation, Leica XPRO, Surdex Group Tool

PROJECT DUTIES

Larry has over 15+ years of direct experience performing Fully Analytical Aerial Triangulation (FAAT) and photogrammetric services. Larry has a unique blend of experience that allows him to accurately and adequately evaluate and process each FAAT challenge.

As a Fully Analytical Aerial Triangulation Specialist, Larry retains complete knowledge of the interrelationships between flight parameters, survey layout and field crew coordination, as well as a thorough knowledge of the challenges associated with each specialty. Larry personally evaluates each FAAT solution, producing the final reports for QC verification and approval. His unique experience in stereocompilation, surveying, and imagery inspection supplement his ability to precisely determine the cause of FAAT anomalies and eliminate them from future occurrences where possible.





PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

PAUL BRIGGS

Chief Pilot

EXPERIENCE

- Surdex Corporation
 - Company: 6 years
 - Professional: 30 years

EDUCATION

- B.S. University Studies, Aviation, Broadcasting and Music, Minot State University North Dakota

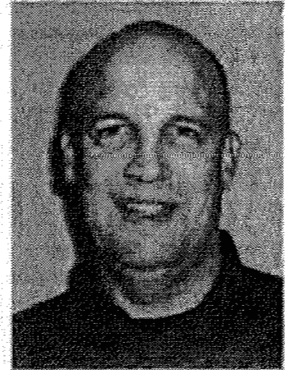
CERTIFICATION

- FAA Certified
- ATP Airline Transport Pilot – AMEL #3055926
- Commercial Pilot, Instrument Pilot – ASEL
- FAA Class 1 Medical
- FCC Radio Telephone Operators Permit
- F27 Type Rating

PROJECT DUTIES

Paul joined Surdex in 2013, bringing over 30 years of exceptional pilot skills and expertise in aerial acquisition. At Surdex, prior to becoming Chief Pilot, Paul trained all of Surdex's new and advancing pilots. As Chief Pilot, Paul is responsible managing Pilot's schedules and availability and knowledge of flight specifications for each mission. He is engaged in the pre-flight planning preparations, including monitoring weather conditions, review of aerial flight plans for LiDAR and photography capture, adherence to overall project specifications, proper equipment and material handling procedures, pre- and post-flight status reporting, and all FAA notices and air space designations along with any NOTAMs (notices to airmen).

Paul is also responsible for updates and adherence to Surdex's ISO procedures.



JASON POHLMAN

Flight Acquisition Manager

EXPERIENCE

- Surdex Corporation
 - Company: 11 years
 - Professional: 11 years

EDUCATION

- Applicable Technical Training for Aerial Survey Sensor Operation; Certificate

PROJECT DUTIES

As Flight Acquisition Manager, Jason is responsible for preparation and/or review of aerial flight plans for the capture of imagery or LiDAR data, adherence to overall project specifications, weather condition monitoring, proper equipment and material handling procedures, pre and post flight status reporting. Jason manages the operation of the sensors, which includes the installation of these sensors into the aircraft and managing maintenance and repair schedules. He oversees the personnel for training on the sensor hardware and software. He maintains a clear understanding of flight capture conditions, internal/external priorities and aerial sensor limitations, installations, calibrations as well as GPS/IMU data collections.





PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

COLBY FORKE, CP Director of Image Processing (Orthoimagery)

EXPERIENCE

- Surdex Corporation
 - Company: 17 years
 - Professional: 18 years

EDUCATION

- B.S. Geography, University of Nebraska

CERTIFICATION / MEMBERSHIP

- ASPRS Certified Photogrammetrist, #1598 (2016)
- Adoption of ISO 9001 Quality Assurance Standards

SOFTWARE PROFICIENCIES

ArcMap, Applanix PosPac, Adobe Photoshop, Orthovista, GeoExpress, MrSID, Socet Set, Softplotter, Microstation, Global Mapper, Leica XPro, Surdex Production Tools (GroupTool)

PROJECT DUTIES

Colby supervises and coordinates all phases of production that includes image processing, ortho-mosaic, and imagery quality control management. Colby works with the imagery and orthoimagery managers daily to coordinate production tasks, set priorities and assist with resource management. Colby directly reports to Michael Mueller, VP of Operations, on resource allocations and progress of each project. He works closely with each project manager to assure our clients' needs are met for every project.



JOHN FRESE Image Product Leader

EXPERIENCE

- Surdex Corporation
 - Company: 16 years
 - Professional: 24 years

EDUCATION

- B.A. Art, Northwestern University, Illinois

SOFTWARE PROFICIENCIES

Surdex Grouping Tool software suite, Leica XPro, Leica FramePro, Intergraph ZIPPS, Symantec BackupExec, Adobe Photoshop, GlobalMapper, IntergraphISAT, Inertial Explorer, Aero Office, Suinox Hydra (distributed processing)

PROJECT DUTIES

As the Image Product Leader, John manages a team that is responsible for all image processing and inspection of digital imagery for each mission flown by Surdex. John has overseen the production of digital imagery for some of the company's largest and most challenging projects.





PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

Photogrammetric Mapping Products & Services

AARON GARIBALDI

Orthoimagery Production Lead

EXPERIENCE

■ Surdex Corporation

- Company: 12 years
- Professional: 14 years

EDUCATION

- Studied Geographic Information Science and Cartography at the University of West Florida

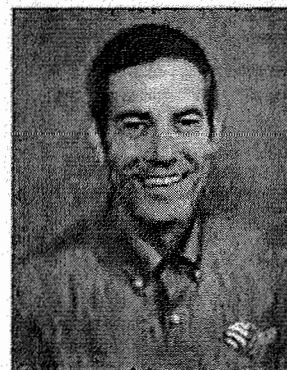
SOFTWARE PROFICIENCIES

ArcMap, Applanix PosPac, Adobe Photoshop, Orthovista, GeoExpress, MrSID, Socet Set, Softplotter, Microstation, Global Mapper, Leica XPro, Surdex Production Tools (GroupTool)

PROJECT DUTIES

Aaron is involved in the production of high-end digital ortho imagery.

His activities include orthorectification, radiometric balancing, cutline placement, Quality Control and final preparation and packaging of digital orthoimage data products.



BRAD BARKER

Director of 3D Mapping (QA/QC)

EXPERIENCE

■ Surdex Corporation

- Company: 20 years
- Professional: 22 years

EDUCATION

- B.S. Cartography and Map Technology, Southwest Missouri State University

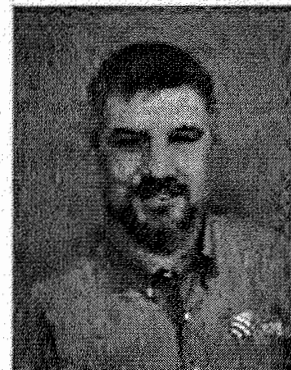
SOFTWARE PROFICIENCIES

ESRI ArcGIS, AutoCAD, Microstation, TerraSolid Software Suite, DAT/EM, LP360, Global Mapper, FME

PROJECT DUTIES

Brad supervises and coordinates the production phases of compilation, LiDAR, and finishing. Brad works with each of the department managers daily to coordinate production tasks, set priorities, and assist with resource management.

Brad's responsibilities include project design for GIS systems, ensuring LiDAR projects meet USGS LiDAR Base Specifications and Quality Assurance for all derivative product creation. Brad has expertise in GIS/CAD and LiDAR software packages including the full ESRI suite of software products.





PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

MICHAEL GOYMERAC
LiDAR Product Lead

EXPERIENCE

- Surdex Corporation
 - Company: 3 years
 - Professional: 12 years

EDUCATION

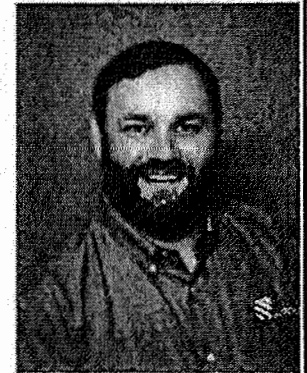
- B.S. Geography, Minor in Geology,
Northwest Missouri State University

SOFTWARE PROFICIENCIES

MicroStation, TerraSolid Software Suite,
GeoCue, LAsTools, ArcGIS (Certified),
Google Earth, Global Mapper

PROJECT DUTIES

As LiDAR Specialist, Michael is responsible for all phases of LiDAR processing and ancillary production. He has intimate knowledge of the entire LiDAR project life cycle which includes planning, acquisition, ABGPS/IMU processing, initial LiDAR processing, manual and automated classification and editing. Michael is well versed with the TerraSolid Suite of LiDAR processing softwares and GeoCue's data management system. He is also experienced with various software packages from his previous photogrammetric mapping responsibilities.



5.6 OTHER

Identify any other detail about performing requested photogrammetric mapping that may be relevant in the evaluation of PAQ responses that distinguishes or differentiates the vendor from its competition:

1. What Distinguishes Surdex

Every firm submitting on this project likely has all the essential components to undertake this project; what separates them is their ability to manage the product, keep you apprised of its progress, and help you evaluate and validate the product quality and accuracy. They should have the knowledge and experience to avoid most issues inherent in large and complex projects and the ability to shift resources/capacity to keep your project on schedule – without any risk to product quality and accuracy. Hard work on our part should equate to an easy project for you.

- Surdex has instituted rigorous standard process for all phases of production; consistency of approach assures consistency of product and improved adherence to schedules.
- Our ISO Quality Assurance (QA) and Quality Control (QC) mechanisms ensure inspection and validation of all data at each phase of production, prior to advancing it to the next phase of production. Catching any defects at the stage of inception, rather than in later stages of production, results in reduced rework, minimal delays, and better product quality. We provide our clients with an average on-time delivery rate of 97%.
- Our Project Management approach calls for ongoing and regular communication with our clients. Tracking the project internally, Project Managers keep your project on task and on schedule, and they communicate progress to you. Should irregularities occur, their first order of business is to apprise you and inform you of corrective action. We provide access to your project's data via our Enterprise database, which is available 24/7.
- As part of acquisition tracking, we can provide you with our Flight Tracker, an online tool that enables you to track your aircraft in real-time. Many of our clients indicate that being apprised of this critical phase is very important to them – and Surdex is the only firm that offers this service.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

Photogrammetric Mapping Products & Services

- We process data through our web-based inspection tool (SurCheckSM), which provides a methodical, easy-to-use process for data inspection. Irregularities are identified, tagged, sent for correction, and re-inspection to provide you with the highest level of quality. We then provide you with SurCheck so your staff can conduct its own QC of the data. Using this process, we have achieved an exceptionally high level of first-time client acceptance (98.8%).
- Our extensive resources enable us to mobilize assets and personnel, as needed, shifting aircraft as needed to take advantage of windows of opportunity for acquisition and moving staff if for any reason a project becomes delayed – such as due to inclement weather. Many of our competitors do not have a large fleet like us, so they have less ability during the acquisition phase.
- All told, Surdex takes extra effort to ensure your project is accomplished on time, as promised, meeting your specifications, as easily facilitated for you and your staff. We have a client satisfaction rate of 98% being “extremely satisfied.” Have peace of mind that your project will turn out exactly as you envisioned.

2. Project Management

Mr. Cornell Rowan will be the project manager and serve as the primary point of contact to your designated representative(s) at all times. Cornell is an ASPRS Certified Photogrammetrist with over 34 years of photogrammetric mapping experience. He will be the direct point of contact, drawing upon others within the Team when required. He reports to the Program Manager for this effort, Mr. Wade Williams, Surdex’s Director of Project Management.

Surdex’s project management approach is founded on providing relevant information backed by frequent communication. Each of our project managers has experience in nearly all phases of production and most are Certified Photogrammetrists. They are guided by the philosophy that they must support the objectives of their clients and efficiently manage internal resources.

Communication can take the form of face-to-face meetings, e-mails, telephone calls, faxes, webcasts, etc. Our project managers are required to communicate with each of their clients at least once each week and are required to respond to a client’s communication within 24 hours of receipt.

If an issue becomes evident to Surdex, our project managers will take the following course of action:

- Inform the client that an issue has arisen and define the situation.
- Develop a set of suggested solutions or actions, consulting internal resources and experts.
- Convey the suggested solutions or actions to the client for discussion and approval.

Each of our project managers is required to:

- Complete a Project Scope document that fully details each project as well as specific internal guidance.
- Conduct a client kick-off meeting to ask questions and arrive at a consensus on all the project’s details.
- Host internal meetings:
 - Kickoff meeting with department heads to review all project requirements, evaluate resources, and establish schedules.
 - Weekly internal status meetings with all applicable department heads and senior management.
 - Project close-out meeting that assesses our performance in detail and results in “lessons learned” to improve future performance.
- Maintain information in our Enterprise database:
 - Weekly updates of project cost-to-complete for each task.
 - Weekly updates of project external and internal schedules.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Upon completion of each project, the Project Manager and the business development representative are required to assess the client satisfaction. These results are tabulated and provided to Suredex's Executive Team as well as posted for all employees. Metrics have also been established to grade our progress.

Suredex has developed custom software based on an Enterprise database implementation that provides real-time status to our internal production and management staff. This includes tracking acquisition designs, acquisition progress, and inspection results for both imagery and LiDAR. It also includes extensive tracking of aerotriangulation, DEM development, digital orthoimagery, planimetric and topographic mapping, delivery, and inspection. During the critical acquisition phase, acquisition will be reported daily via graphical and textual reports. Since image inspection occurs in parallel with acquisition, every day includes an update on inspection status and the possibility of isolating re-flights in a timely fashion.

3. Communication for Multi-Participant Projects

Suredex often coordinates projects among several counties, municipalities, and other public entities. For example, in 2018 a project in the State of Mississippi consisted of 10 counties including individual contracts with each partner. One of the largest factors contributing to the success of a project is continuous communication.

Our primary form of communication (receiving and delivering progress reports, responding to questions, etc.) is via the regular email progress reports (noted in the project management section of this document). Each participant receives regular updates which describe the status, any difficulties, proposed resolution, and outcomes of fixes. Participants are continuously updated as to their individual schedules.

Should there be a need for a more immediate, collective form of communication, Suredex can establish a group conference call (in which participants dial up on the telephone) or webinar (in which participants log on to the Internet to share the same screen). Suredex can also attend an in-person meeting with participants at a location convenient to all participants or host the meeting at our facilities.

Proposed Method of Performance

PART ONE: ORTHOPHOTOGRAPHY

Suredex proposes acquiring digital imagery using the Leica ADS100 sensor in aircraft determined by availability and suitability. Suredex will establish sufficient ground control to achieve the prescribed specifications and accuracy standards, with sufficient QC points to validate project accuracy.

Our primary collection parameter is a sun angle above the horizon of 30 degrees or greater. We plan the collection around this number with the general goal of having at least two hours of 30 degrees of more sun angle a day. Using this as a guide, we select the target acquisition dates. Once selected we begin to monitor weather conditions to identify windows of opportunity with suitable atmospheric conditions. When weather is predicted collection conditions, we contact the client to make sure ground conditions for snow, ice and water are appropriate. If approved, we deploy to the base airport in the Mid-Missouri Partners the day before the flight. On the day of flight, we check the weather forecast and fly when the conditions are appropriate.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

The following table presents our understanding of the *general* specifications for orthophotography portions of the project. With multiple scenarios / resolutions (3" / 6" / 12" GSD) / project areas, this narrative will describe our acquisition and production process in general. Surdex will discuss these options with Boone County and other participants to elaborate on the scope, answer any questions, and refine a final scope of work. For the most part, each county will be flown at the dominant resolution with higher/lower resolution sub-areas flown separately.

Summary of Digital Orthoimagery Specifications (3" / 6" / 12" GSD)			
Parameter	Specification	Comments	
Acquisition Timeframe	Spring 2019	10am – 2pm local time	
Buffer	300'		
Ground Conditions	Leaf-off Ground unobscured by snow, haze, fog, dust. Less than 5% cloud cover.		
Sun Angle	Minimum of 30°		
Resolutions by Areas	3" GSD	University of Missouri, Columbia	4.8 sq mi
	6" GSD	Boone County (746 sq mi)	1,340 sq mi
		Cole County	
		Howard County (partial)	
		Callaway County (partial)	
		Cooper County (partial)	
	12" GSD	Moniteau County (partial)	2,287 sq mi
		Howard County	
		Cooper County	
		Callaway County	
Bands	3-Band (Red, Green, Blue)	Optional Color IR on county-by-county basis	
Imagery Formats	ESRI Format		
Accuracy Standards	ASPRS Standard Mapping		
Ground Control	Control points and QC points to be determined based on scenarios selected	Controlled using Airborne GPS, MoDOT GPS Reference Station Network and/or MO DNR Geographic Reference System	
Datums	Vertical: North American Vertical Datum 1988 Horizontal: North American Datum 1983	(NAVD88) (NAD83)	
Reference Frame	Missouri State Plane Central Zone Coordinate System	US Survey Feet	

A. AERIAL ACQUISITION OPERATIONS

Imagery acquisition is the most critical phase of the project. Surdex brings over a half-century of experience collecting image data and understands the limited opportunities for image acquisition. With Surdex's 10 aircraft located in Chesterfield, Missouri, we can have aircraft "on line" in less than an hour, enabling us to take advantage of good weather to maximize capture.

The start and finish of acquisition will be coordinated with Mid-Missouri Partners to ensure acquisition with optimal visibility and ground conditions.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

1. Aircraft

Surdex is widely regarded by clients and colleagues as one of the premier aerial acquisition companies in North America. All of our aircraft are owned and operated by Surdex. We have a fleet of ten acquisition aircraft, which are listed in Section 5.4 earlier in this document.

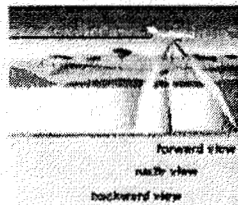
- All aircraft are made by Cessna, standardizing maintenance, repair, inspection, operation, and training.
- Ability to host any of our aerial data acquisition instruments (digital imaging sensors, LiDAR).
- A mix of slower/lower and faster/higher aircraft to address our versatile acquisition equipment and maximize our resources.

2. Sensor: The Leica ADS100 Digital Pushbroom Camera

Surdex owns five (5) Leica ADS100 Airborne Digital Sensors, making our installation the largest in the United States and one of the largest in the world. Surdex-led teams have logged over 4 million square miles of coverage with the ADS100 as our primary sensor since late 2013.

The pushbroom imaging geometry of the ADS100 includes sets of arrays in the forward, nadir, and back configurations, collecting imagery simultaneously to produce a "pixel carpet" of the ground scene and providing alternative views of the ground scene and stereoscopic coverage. Each set of arrays acquires at full resolution in red, green, blue, and near infrared.

Leica ADS100 Imaging operations (courtesy of Leica Geosystems).



Leica ADS100 Imaging Arrays				
Array	Bands	From Nadir	FOV	Pixels
Forward	RGBN	25.6°	65.2°	16,000
Nadir	RGGBN	0°	77.3°	20,000
Backward	RGBN	19.4°	71.4°	18,000

Pushbroom systems present optimal imaging geometry for digital orthoimages and support highly efficient production:

- With the image displacement only varying across the format – and not radial from the center as with frame-format cameras – the amount of elevated feature lean in the final product is dramatically reduced.
- The pixel carpet acquired by the ADS100 substantially reduces the amount of seamlines required to mosaic the orthoimages together, reducing the production effort and minimizing the possibility of seamline artifacts. Correspondingly, the orthoimagery inspection effort is reduced.
- The ADS100 stereoscopic geometry yields the highest attainable horizontal and vertical accuracies and can meet the most stringent ASPRS standards. The ADS100 stereoscopic geometry is superior to the 9"x9" film cameras relied upon for decades.
- With the telecentric lens design of the ADS100, all light rays strike the focal plane normal to the arrays, resulting in the same radiometric response for all pixels. This avoids the well-known "fall-off" issues at the edge of the exposure encountered by the lenses of conventional frame-format cameras. This simplifies balancing during the mosaicking step by minimizing the image-to-image fall-off issue.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
 Photogrammetric Mapping Products & Services

- With each band (R,G,B,NIR) in each array collecting at full resolution, features imaged by the ADS100 do not exhibit the blooming and smearing attributed to the pan-sharpening approach taken by virtually every large-format digital frame camera on the market today. This enhances interpretation and results in an aesthetically pleasing rendition of color. This project calls for 3-band imagery, with options for 4-band on a county-by-county basis.
- The spectral responses of the bands do not overlap, making the ADS100 ideal for automated image classification.



Features and Benefits of the ADS100	
Feature	Benefit
20,000 pixels wide at nadir – one of the largest swaths of any digital sensor on the market today.	Reduced acquisition effort and time. Fewer resources required for large projects.
Smallest pixel size (5um) of any sensor used today.	Allows increase in acquisition altitude, reducing flight time in rugged terrain since fewer line breaks are required, and can often operate above problematic airspaces.
Time-Delayed-Integration (TDI) image motion compensation for the first time in a pushbroom system: (1) Reduces integration/cycle time (2) Increases sensitivity (3) Increases airspeeds	Improved acquisition performance. Higher image quality.
Nadir, forward, back arrays have full color and near infrared.	Improved stereoscopic viewing and exploitation.
Best base-to-height ratio (0.8) of any sensor on the market.	Superior accuracy for digital orthoimagery and topographic mapping.
Benefits of the pushbroom approach: (1) Near-nadir views of ground features (2) Fewer seamlines required in mosaicking process (3) Continuous stereoscopic imaging using the forward and aft arrays	Substantially less building lean. Reduced production effort. Reduced QC effort. Unlike frame-format cameras, full stereoscopic coverage along the flight direction in rugged terrain.



PROPOSAL
 48-16NOV18 PAQ | CS170285001-004 CONTRACTS
 Photogrammetric Mapping Products & Services

Leica ADS100 Specifications						
Parameter	Value					
Sensor Type	Pushbroom					
Pan-sharpening	None					
Cross-track pixels	Forward: 16,000 Nadir: 20,000 Backward: 18,000					
Focal length	62.5 mm					
F-number	f4					
Pixel size	5.0 um					
Parameter	Value					
Pixel registration accuracy	1 um					
Integration time	≥ 0.5 ms					
Height: GSD ratio	12,500:1					
Cross-track field of view (FOV)	77.3°					
Along-track field of view (FOV)	Fwd: 25.6° Back: 19.4° Stereo: 45°					
B/H Ratio	0.80 (Traditional film cameras: 0.6)					
Radiometric resolution	14 bits/pixel					
Imaging arrays R= red G = green B = blue N = near Infrared	13 Arrays: Fwd: RGBN Nadir: RGGBN Back: RGBN					
Radiometric response (nm): Red Green Blue Near Infrared (NIR)	<table border="0"> <tr> <td>619-651</td> <td rowspan="4"> </td> </tr> <tr> <td>525-585</td> </tr> <tr> <td>435-495</td> </tr> <tr> <td>808-882</td> </tr> </table>	619-651		525-585	435-495	808-882
619-651						
525-585						
435-495						
808-882						

The non-overlapping spectral bands support 4-band projects and are ideal for automated classification.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Using a calibration range near our headquarters or in the field, each ADS100 is "bore-sighted" to determine the alignment and position of the sensor with respect to the GPS antenna and Inertial Measurement Unit (IMU). Surdex also maintains an absolute radiometric calibration of each ADS100 (performed by Leica) to ensure optimal image quality and appearance.

The pushbroom technology offered by the ADS100 streamlines production, especially in situations around elevated structures such as overpasses, bridges, etc. that are not typically represented in bare earth elevation models. Such features generally require a localized surface elevation model to ensure accurate portrayal. Since many features are captured in a near-nadir fashion by the ADS100, this additional production effort is not always required.

The ADS100 forward and aft arrays support stereoscopic exploitation and also provide alternative views of ground features during orthorectification and mosaicking. For example, if specular reflectance hampers imagery from the nadir array, the forward or aft array views of the area can provide an alternative, eliminating this artifact.

The ADS100's arrays provide varying perspectives along the flight line, supporting stereo exploitation and alternative imagery during mosaicking. (Wilson, NC 2017)

Aft array view



Nadir array view



Forward array



Direction of

B. PROJECT DESIGN

Because there are so many scenarios, it is impossible to provide a definitive project design (flight and control design); upon award, the final project areas will be determined among the participants, and a design will be circulated for approval. All design elements are created to ensure optimal efficiency, taking into account the resolution (GSD), sensor swath width, flight lines, and buffer area. The survey control will be established for all flights – imagery and LiDAR – to maximize coverage and efficiency.

The project design is based on the deliverable tile layout and a 300' buffer around the boundary. Flight planning is the responsibility of Surdex's Flight Acquisition Manager, and each flight plan is reviewed and approved by the Project Manager. The Aerotriangulation and Survey Departments design the ground control network under the direct supervision of a Certified Photogrammetrist and a Registered Land Surveyor.

1. Imagery Flight Design

With multiple diverse options (for both imagery and LiDAR acquisition), this section will discuss our design process in general, opposed to creating specific designs. For each of the four scenarios (covering different area at varied resolutions (from 3" GSD, 6" GSD and 12" GSD for orthoimagery), Surdex will determine the appropriate flying height to ensure the resolution is met. A flight diagram will be laid out with the Leica MissionPro planning software to establish flight lines, and then determine the number and location of control points that are required in order to meet the accuracy specifications. Flight lines will be acquired with a minimum sidelap of 30% to ensure adequate coverage (the ADS100 is a pushbroom sensor and as such has no forward overlap)



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

This software utilizes an elevation model to rigorously check for adequate forward and sidelap coverage as well as desired product GSD. Flights are planned against the buffered coverage for each seasonal window portion of applicable project areas.

2. Ground Survey Design

After the flight design is complete, Surdex will determine the number and placement of control points that will be required to ensure product accuracy and check points required for validation of the deliverables. Control will be established for both the imagery and LiDAR flights for optimal cost efficiency.

Ground control points are placed to provide a connection between the ground coordinate system and the imagery coordinate system. All imagery will be acquired with a geodetic grade GNSS receiver on the aircraft to reduce the number of needed ground control points. Control points will be generally placed in an evenly distributed pattern throughout the project area. These points will be used in the triangulation process to adjust all the aerial imagery into the project coordinate system.

As a quality check process, Surdex will also target and survey additional ground check points to be used exclusively in the quality check process to evaluate the accuracy of the final digital orthophotography. This QC process will assure that the digital orthophotography meets ASPRS accuracy standards as outlined in the specifications.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

Photogrammetric Mapping Products & Services

Our design approach is:

- Utilize any existing survey points, some of which may be unrecoverable and may need replacement.
- Individual control/check points will be either paneled or photo-identifiable.
- A certain number of check points will be identified to provide independent validation of the project accuracy.
- Overall uniform dispersion of control over the entire project.
- Focus on placing control at junctions of strips, maximizing the number of observations of control points during aerotriangulation to strengthen the solution.

3. Acquisition Effort

During the Spring of 2019, at a 30° sun angle, Surdex will be able to acquire imagery for approximately 4 hours a day during clear weather. Pilots will follow the final approved flight plan, during the hours meeting the minimum sun angle. Owing to the unpredictability of weather, our flight department will mobilize aircraft for a project area when visibility and ground conditions are suitable, and when they are not, the pilots will be redirected to clear areas. This system enables us to acquire multiple projects and shuffle resources to optimize windows of opportunity, as needed.

Imagery is inspected after acquisition, and if any voids or unsuitable imagery is present, a reflight is scheduled as soon as possible following the original flight; this ensures the highest degree of similar conditions between the original imagery and recaptured imagery.

Based on the available hours and the total estimated acquisition hours from the project design, we anticipate up to three imaging aircraft and up to two LiDAR sensors will be required for this effort.

C. AIRBORNE IMAGERY ACQUISITION

Acquisition of imagery is one of the most critical phases of any project and requires an extremely high degree of communication between Surdex's Chief Pilot, Flight Acquisition Manager, aircrews, and project manager. Flight plans are updated each evening by merging daily flight reports from the aircrews with the results of imagery inspection to quickly isolate potential re-flights. The Enterprise database issues revised flight plans daily to aircrews via the Internet and/or e-mail.

Surdex's Pilots will inform the local Air Traffic Control (ATC) and/or military air traffic control authority in advance of flight operations. This includes providing aircraft tail numbers and flight designs to ensure the local authority is fully informed. For acquisition involving restricted airspaces and/or Military Operations Areas (MOAs), thorough coordination with the Air Traffic Control centers and often military operations centers is required. In such cases, Surdex proactively provides the necessary information, including flight plans, to the proper authorities to ensure trouble-free access to the areas. Surdex has performed acquisition in and around highly sensitive airspaces, such as White Sands Missile Range (New Mexico), Nellis Air Force Base (Nevada), and the Washington, DC ADIZ (Air Defense Identification Zone). Experience has shown that high degrees of communication and adherence to directives results in long term success. In some cases, a government official has even been present on the aircraft.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Acquisition Approach	
Feature	Benefit
Strong coordination with the client: (1) Start and stop acquisition timeframe. (2) Movement to/from the project area. (3) Adherence to client specifications on window, sun angle, etc.	Clients are always aware of our presence on their project.
Coordination with FAA and military operations centers if required. Surdex has successfully operated in some of the most highly sensitive airspaces in the U.S. and Canada.	Assure trouble-free access to restricted or military operations areas.
Monitoring of short and long term weather: (1) Use of weather resources. (2) Enterprise database retains weather reports at each project site during each acquisition window.	Achieves optimal utilization of resources to ensure success for all projects.
Near real-time reporting of status – acquisition and results of inspection.	Clients continuously aware of their project's progress.
Minimize the acquisition window length – oftentimes by putting multiple aircraft on the project. This minimizes the effects of weather and climate on image appearance.	Highest possible image quality across the entire project.
Our large fleet of aircraft and sensors	Ability to handle numerous projects across North America.
Our Enterprise database tracks all acquisition and inspection status: (1) Real-time tracking of our aircraft to monitor acquisition operations. (2) Flight plans updated daily. (3) Re-flights prioritized to ensure minimal time difference. (4) Daily issuance of status.	Maximum application of resources to ensure success.

During imagery acquisition, Surdex flight crews employ the manual exposure value method. Once the aircraft is at the capture altitude, light meter readings are taken over representative terrain and appropriate exposure parameters are locked down. Sensor operators then monitor the meter's measured exposure value beside the current locked value along each flight line. If the locked value differs from the meter's average indicated value by more than 1/3rd f-stop, the operator adjusts the locked value. This exposure metering method is superior to the automatic approach since it does not respond to small bright or dark areas in the scene that would bias the exposure at the expense of the larger area.

Before each acquisition day, a number of activities are undertaken by the aircrew:

- Up-to-date flight plans are downloaded and reviewed.
- Aircraft, ABGPS, IMU, and camera are all inspected for proper operation.
- Final weather checks are made.
- Flight plans are filed with the local airport/FAA.
- If required, base stations are set up.

At the end of each acquisition day:

- Aircraft flight logs are completed.
- Flight reports are completed and emailed or faxed to the production center.
- If necessary, imagery and data transferred from on-board storage to "transfer" hard drives.
- If appropriate, transfer drives are shipped priority overnight to the production center.

It is critical to collect ABGPS/IMU data with the highest possible integrity, taking into account such factors as:



PROPOSAL
 48-16NOV18 PAQ | CS170285001-004 CONTRACTS
 Photogrammetric Mapping Products & Services

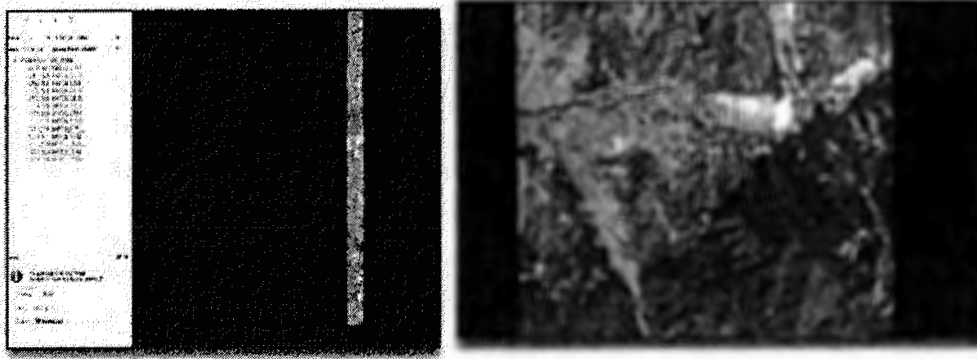
- Operation of base stations to maintain a reasonable distance to the project area.
- Avoiding IMU drift by limiting the length of lines – generally less than 80 miles or 20-30 minutes of flight.
- Using CORS (Continuously Operating Reference Stations) and/or local GPS reference networks to provide multiple observations.

Surdex retains the flight report for each mission and each is reviewed by production personnel. For example, if extreme turbulence or cloud cover is cited by the aircrew for specific areas of the acquisition, prioritized attention is paid to these areas by the inspectors. This may result in a re-flight of a portion or all of a flight line.

D. IMAGERY INSPECTION

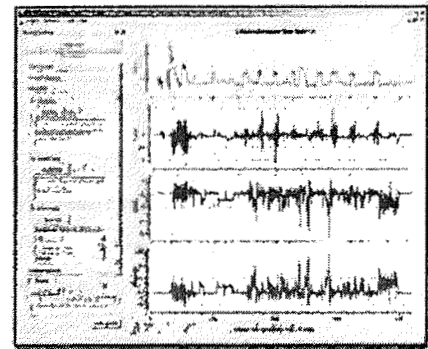
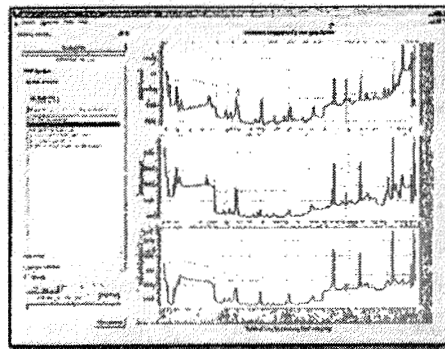
Imagery inspection is critical to the overall success of the project, so all imagery is viewed, graded, and stored in the Enterprise database. Only with this approach can a qualified and timely determination be made regarding the possible need for re-flights and image quality ensured.

ADS100 imagery inspection interface.



Hand-in-hand with image inspection is the processing of ABGPS/IMU data, which supports image reconstruction for pushbroom cameras. Suredex uses the standard Leica workflow to capture and process the ABGPS and IMU data. The ADS100 carries the Novatel SPAN GPS/GNNS inertial navigation system in the aircraft. Suredex uses Trimble R8 model receivers to collect ground base station GPS and GLONASS data during each flight. The position of the ADS100 sensor and the GPS antenna are measured within the coordinate system defined by the central axis of airplane. These measurements along with the GPS and IMU data captured on each flight are processed using Novatel Inertial Explorer software. Inertial Explorer produces a differential solution for the airborne positions and attitude more than a hundred times a second for the duration of the flight. As the Leica ADS100 is a line scanner there are no individual stations, but rather a stream of epochs or fixes are produced at a rate of 128 per second. Only during aerial triangulation are discrete fixes calculated at a spacing dictated by image measurement density.

ABGPS/IMU processing: positional (left) and accelerator (right).





PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

E. AEROTRIANGULATION

Since aerotriangulation (AT) provides the foundation accuracy for the project, it involves checks and balances to ensure accurate results are provided to production process to avoid costly and time-consuming re-work. The inputs to AT include ABGPS/IMU data, sensor boresight data, sensor calibration data, ground control and check point data, as well as the imagery itself.

The AT process involves the following steps:

- Automated measurement of pass and tie points appearing in the overlaps of the imagery.
- Interactive editing of pass and tie points.
- Measurement of control and check points.
- Bundle adjustment yielding refined imagery position and attitude and all point positions.
- If required, re-measurement of points and repetition of the adjustment.

The AT solution is based on a sophisticated bundle adjustment employing a mathematical model of the imaging geometry. It relies on the use of far more observations (observed/recorded values such as ABGPS, IMU, ground control, and image measurements) than are required for a unique solution. Using a least squares optimization approach the observations are refined for a best fit. Careful inspection is made of the various residuals (differences between observed and adjusted values of parameters) reported by the solution. For example, should an ABGPS observed position differ from the adjusted value by a significant amount, this may signal flawed ABGPS data or processing.

Analysis of the quality of the AT solution is performed by a Certified Photogrammetrist who is highly skilled and experienced with the process. Upon the completion of the AT process, the results are stored in the Enterprise Database and published for use in the following production steps.

There are several types of points that are measured during the AT process:

Aerotriangulation Points Type		
Type	Description	Measurement
Tie points	Points collected in overlapping images along a flight line/strip of imagery. Used to ensure images in the strip are tied together.	Automatically collected and measured, but may require manual collection and/or editing in difficult areas (dense vegetation, water bodies, etc.).
Pass points	Points collected in overlapping images in adjoining and overlapping flight lines/strips. Ensures adjoining strips are tied together. Pass points are often also tie points so as to strengthen the overall solution.	
Control points	Points of known ground position. Often paneled for recognition and accurate measurement. Manually measured.	Manually measured.
Check points	Points of known ground position. Often paneled for recognition and accurate measurement. Not held to their known position during the AT adjustment process. By allowing their positions to "float", they provide an independent check on the accuracy of the AT.	

The Leica XPro software is used to triangulate ADS100 imagery. It is important to point out that the forward, nadir, and aft arrays of the camera essentially form three separate images of the strip. Thus, the pushbroom scanner is analogous to a frame camera in that all points are imaged in three-way stereoscopic views. Leica's Orima software is used to perform the bundle adjustment.



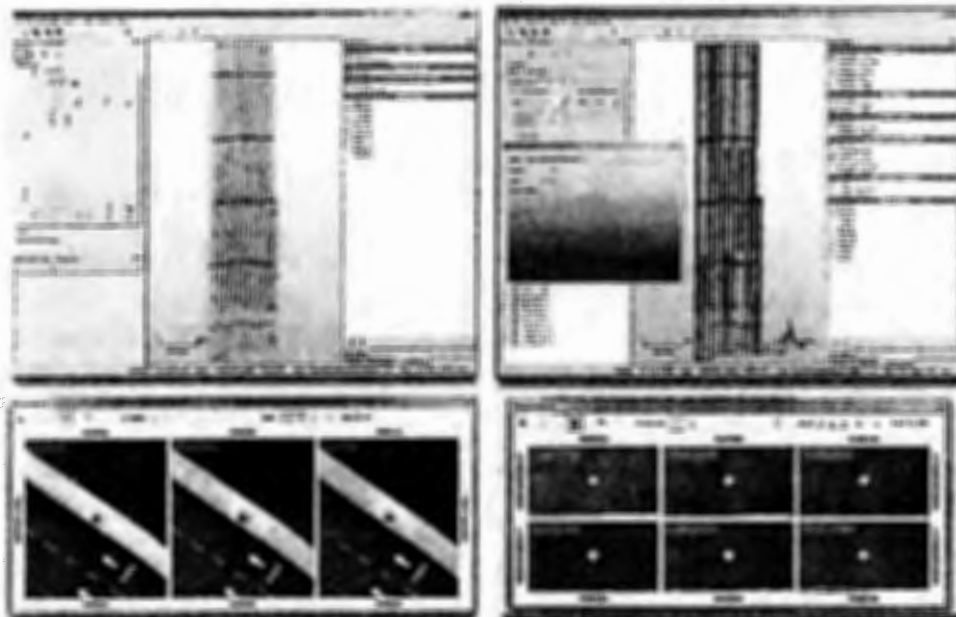
PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

Photogrammetric Mapping Products & Services

Aerotriangulation of pushbroom imagery is simplified over the aerotriangulation of frame imagery. There are fewer images from a logistic standpoint, simplifying the amount of automatic matching and manual editing that must be performed. Additionally, the trajectory model ensures cohesive and accurate results within each strip.

Leica XPro ADS100 aerotriangulation interfaces.



An aerotriangulation report written by a Certified Photogrammetrist can be provided upon request. This addresses the following items:

Standard Aerotriangulation Report Contents	
Item	Description
Reference frame	Definition of coordinate reference frame used for the aerotriangulation, to include map projection, horizontal datum, vertical datum, linear units (US Survey Feet, Meters, etc.).
Flight line indexes	Shapefile and/or graphical plot illustrating the imagery coverage against the project area. (1) For frame imagery, exposure stations represented as points. (2) For pushbroom imagery, the flight lines represented by polylines between the start and stop of imaging.
Point index	Shapefile and/or graphical plot illustrating the points used in the bundle adjustment, their type, and their identifier.
Weight values	List of weights (standard errors) assigned to all parameters.
Sigma naught (σ_0)	Fundamental single value that expresses the accuracy of the least squares bundle adjustment. Usually reported in microns or pixels and is on the order of 0.1-0.3 pixels.
Standard errors of control points	X,Y,Z standard errors of control points as reported by the bundle adjustment.
Final adjustment of control points	List of control points and a priori and final positions (X,Y,Z).
Points removed from the bundle adjustment	Points (any type) removed from the bundle adjustment and reasons why this action was taken.
Item	Description



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Residual summaries: (1) Points (by type) (2) Measurements (3) Camera positions (frame) (4) Trajectory (pushbroom)	Summary of RMSE (Root Mean Square Error) values and estimated accuracy as reported by the bundle adjustment.
Narrative	Summary of software used for the measurement of points and bundle adjustment, issues encountered, etc.

F. FIELD CONTROL SURVEY OPERATIONS

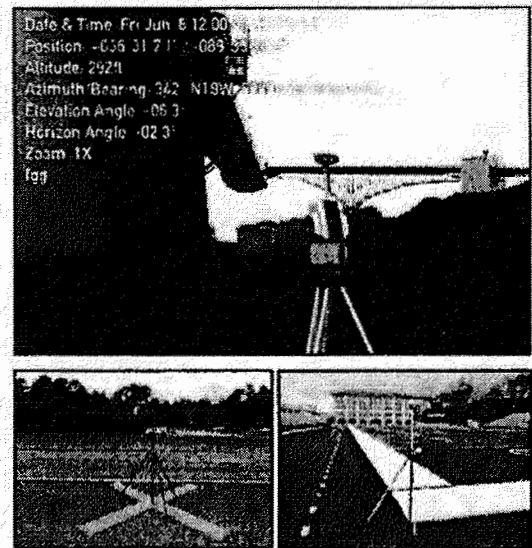
The control layout will encompass all final project areas for both the imagery and LiDAR acquisition. To assure consistency in the field data and eliminate observation errors, only fixed height range poles will be utilized during GNSS field data collection. The survey will include only GNSS geodetic receivers set to a minimum of five second epochs for data collection. A minimum GNSS vector observation time of 30 minutes will be utilized. The general data collection minimum observation time will be determined by the vector length using the formula: observation time = 30 minutes + 1 minute per kilometer beyond 30 kilometers. For each GNSS observation site a sketch will be developed, and a digital photo will be acquired in the field. The digital images will be acquired with a software application like Theodolite that automatically records GNSS coordinates and time on all field images.

The basic network design will be a GNSS rapid static network, tied into National Geodetic Survey (NGS) horizontal and vertical monuments. The NGS monumentation will consist of a minimum level 1st order horizontal monuments and 2nd order vertical monuments. On a daily basis all field observations and notes will be downloaded to the Surdex ftp site by field crews. The Waypoint GrafNet or similar GNSS Least Squares post-processing software will be utilized for all office processing of GNSS data. An initial free-net adjustment will be done to validate the observations and locate any blunders in the input data. The free-net adjustment will be constrained to one NGS monument, creating a minimally constrained network.

Once the free-net adjustment is completed, all observation data will be processed through the Online Positioning User Service (OPUS). The OPUS solutions for all observations will then be input into the post-processing software as check-points in the solution. A second free-net adjustment will be performed to evaluate the OPUS check-points against the NGS monument free-net. Any discrepancies will be investigated and resolved.

The final adjustment of the network will be fully constrained to a minimum of four NGS horizontal monuments and three NGS vertical monuments. In addition, a minimum of three surrounding NGS Continuously Operating Reference Stations (CORS) sites will be downloaded into the project. The final constrained adjustment will be held to the NGS monuments and all CORS and OPUS solution positions will be evaluated as check-points. Any irregular discrepancies in the final network will be evaluated and resolved. This method of least squares adjustment of the survey network assures a known relationship between the NGS monumentation, CORS, and OPUS solutions within the survey observations.

Ground survey operations.



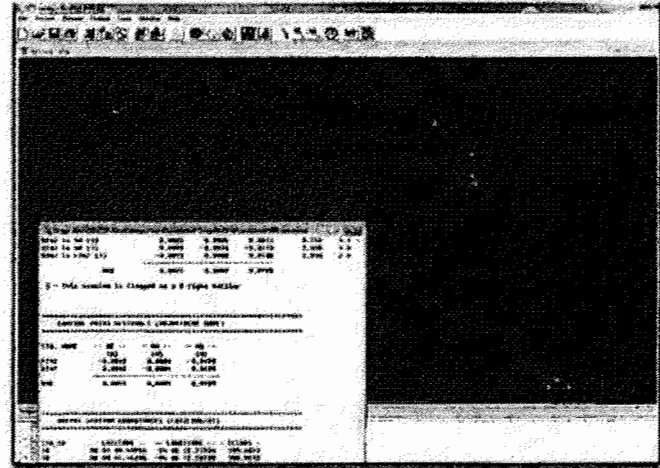


PROPOSAL
48-16NOV18 PAQ | CS170285001-004 CONTRACTS
 Photogrammetric Mapping Products & Services

In summary:

- Ground photos will be provided for each point along with pictures of the location to guide measurement of the points during aerotriangulation and orthoimagery accuracy validation.
- A control diagram will be furnished for all survey points utilized on this effort. This will include point positions and observed baselines designating beginning and ending points.
- A least squares adjustment will be performed for all control points. Output to be furnished in Excel format will include results of the constrained and unconstrained adjustment. This will include fixed coordinates and adjusted coordinates in latitude, longitude and ellipsoid height, error ellipse values in meters, relative baseline error ellipses in meters, precision of the observed baselines in parts per million (ppm), and redundancy expressed as degrees of freedom.
- All field notes and observation logs will be neatly kept and indexed. This includes notes pertaining to the establishment and/or extension of monuments. For recovered monuments, information on the condition of each point will be provided in the notes. The observation logs for each point will include all information pertinent to the recovery and observations required for office post-processing.

Survey network adjustment using GrafNet software.



G. DIGITAL ELEVATION MODEL (DEM) UPDATE/EDIT

There are two options for how the Digital Elevation Model can be updated based on the final scope of work chosen by the County. It is our presumption that if Boone County chooses to acquire new LiDAR, then that data would serve to generate a new DEM. Using this method, generation of the DEM could not begin until the LiDAR data processing had been completed (pushing the overall schedule back). Alternatively, Surdex could photogrammetrically update the DEM.

This approach is based on using all existing elevation data, augmented where missing or requiring update, by digital correlation and/or interactive editing. Dense image mapping will be developed, consistent with existing spacing and density, to create an accurate surface model required for orthorectification. To provide the most accurate terrain model, the elevation model is stored in Triangulated Irregular Network (TIN) format to support a Digital Terrain Model (DTM) that accommodates a mixture of both gridded and irregularly spaced points, as well as mass points.

If areas require an update, we often use the Leica Semi-Global Matching (SGM) software to create an initial elevation model. SGM yields very high integrity surface models by matching nearly every pixel in all imagery overlaps to create a "photogrammetric point cloud" analogous to first return LiDAR data.

H. PILOT PROJECT

A Pilot Project will be undertaken prior to full-up orthoimagery production in order to:

- Establish the desired appearance of the orthoimagery.
- Check the file form and format against project specifications.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

Photogrammetric Mapping Products & Services

Surdex will coordinate the selection of one or more representative areas of varying ground cover (e.g., urban, suburban, rural, wooded, etc.). Orthoimagery samples will be provided in these areas to establish standards for clarity, tone, balance, and contrast desired for the project. This may require iterative processing of the samples to achieve the desired appearance. Suredex then processes all deliverable imagery to the appearance established during the pilot project.

Surdex typically uses "image metrics" developed on the USDA NAIP to guide initial processing. Our custom software automatically computes many of the image metrics during processing and stores the results in our Enterprise database – beginning with initial processing of the raw imagery all the way through mosaicking and balancing. In our opinion, the key metrics are:

- Histogram clipping – taking care to preserve a tonal range that does not interfere with shadow detail or "blow out" bright areas.
- Brightness – centering the mean pixel count to ensure overall balance. Note that this metric sometimes requires localized modification in unusually bright or dark areas.
- Contrast – properly maintaining contrast to avoid faded or washed out areas.
- Color balancing – performed to avoid shifts in color. A key measure here is that of "neutrality," which means that gray features (concrete roads, for example) remain so during processing. If gray features are preserved, overall true color is maintained throughout.

With years of experience and customized processes and software, Suredex has gained expertise in handling the critical global balance process over very large areas – even the ability to incrementally produce and deliver data to meet client priorities while still maintaining a consistent overall result. Our experience is that only minor radiometric adjustments around seamlines are needed to ensure flawless colorimetry across the entire project area.

I. DIGITAL ORTHOIMAGERY PROCESSING

1. Image Processing Approach

Our approach to image processing involves the following key points:

- Sensor-specific processing is used at the front-end of the production chain using sensor manufacturer software. This includes initial color balance, brightness, contrast, etc. Afterwards, all image processing is handled with Suredex's custom-developed software and processes.
- All imagery is retained in 4-band and 12 bits/pixel format ("4x12") until the final tiles are produced. This allows us to make localized adjustments to color, tone, contrast, etc. without compromising the overall quality of the deliverable product.
- The 4x12 format supports re-mapping to 8 bits/pixel, and to color and/or color infrared (CIR).
- All image resampling is performed using bi-cubic or Lagrange interpolation kernels to eliminate aliasing and similar artifacts.

Orthoimagery is produced to a contiguous "Master Tile" layout that encompasses the entire deliverable area with adequate buffering in 4x12 format in the reference frame of the project deliverables. Once the Master Tiles are completed, they can be used to generate all delivery tile layouts, including re-projection and changing of linear units (i.e.: US Survey Foot, International Foot, Meter, etc.) and re-mapping to the desired bit depth and number of bands using an automated process.

Surdex's customized processing environment is a mix of third party, open source, and custom-developed algorithms and processes, operating within a distributed processing environment. We utilize a common user interface, referred to as "Grouping Tool" (GT), and our entire production and project management staff is trained



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

Photogrammetric Mapping Products & Services

in its usage – simplifying cross-training to maximize the staff potential. An underlying Enterprise database tracks all source, interim, and final products. Image processing and orthorectification technicians all utilize calibrated display monitors to ensure consistent results.

Features and Benefits of Surdex's Orthoimagery Production Process	
Feature	Benefit
Image color, tone, balance, etc. prototyped before production begins in a Pilot Project.	Client participates in desired appearance of final product far in advance of delivery. The pilot project also checks form and format of deliverable imagery, metadata, etc.
All image processing and production performed in "4x12" space (4 bands, 12 bits/pixel) until the cutting of deliverable image tiles: (1) Generate color, 4-band, and/or color infrared (2) 8 or 12 bits per pixel deliverables	Preserving full content provides maximum latitude in mosaicking process. Ensures highest possible quality products.
Internal production tiles are in a contiguous (seamless) format, with deliverable tiles generated at the final stage. This supports: (1) Overlapping deliverable tiles (2) Multiple deliverable tile layouts (3) Multiple map projections (4) Multiple product resolutions	Accommodates clients with requirements for multiple layouts of deliverable products at marginal additional cost. Accommodates last-minute changes. Edits to data only done once to support multiple products.
Highly automated absolute radiometry and atmospheric processing, reduces: (1) Level of subjectivity by technicians (2) Production labor effort (3) Changes to be made in final stages of production	Higher volume and throughput.
Customized seamline generation process: (1) Highly effective (2) Inclusion/exclusion areas (such as building footprints)	Seamless final product. Reduced customer review.
Proven ability to incrementally produce large orthoimagery projects while preserving a seamless appearance at completion.	Allows incremental QC and delivery to address client priorities, leveling of QC resources, and schedule compression.
Enterprise database underlying all imagery and data.	Complete lineage of all processing. Automated generation of FGDC-compliant metadata.
Web-based QC tool available free-of-charge for clients: (1) Reduces cost and time associated with multiple deliveries of hard drives (2) Fast turnaround of fixes and validation of fixes (3) Progress tracking	Accelerates QC and acceptance process. Audit trail of all changes. Reduces time for customer QC.

Using Surdex's Grouping Tool, image processing technicians organize large blocks of orthoimagery into groups with common characteristics, not necessarily coinciding with individual flight missions. The tool can display images in ground space, allowing operators to see the relative image quality between neighboring images and can be viewed in either color or CIR to ensure 4-band continuity. The grouping of images is important because:

- The atmospheric conditions during capture may result in imagery covering regions of differing degradation caused by haze. This is particularly true in coastal areas.
- Sun movement during the day affects the direction of sun illumination. Understanding this allows efficient solar corrections of groups with common illumination effects.



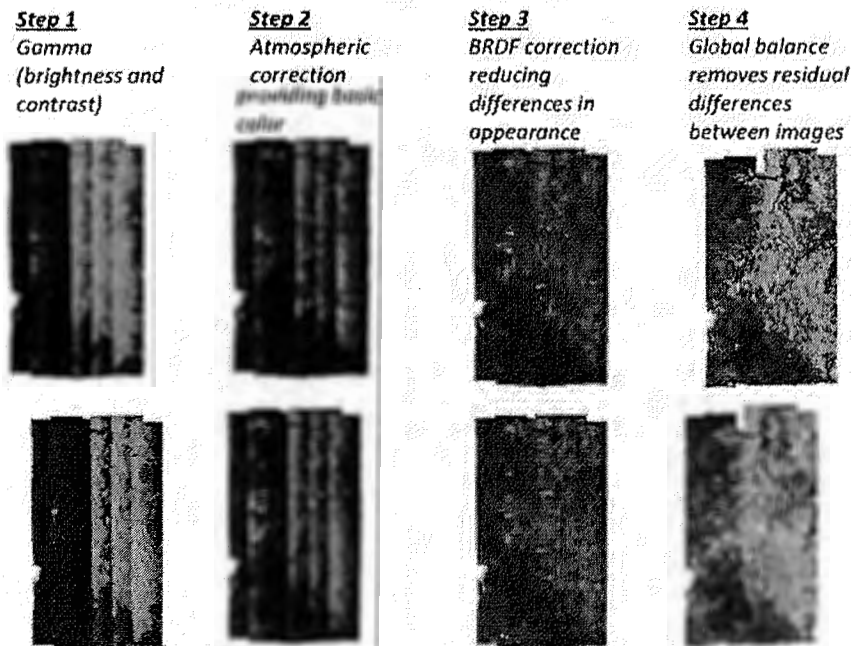
PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

There are distinct steps in the overall image processing:

- Grouping of image strip blocks and initial color corrections with a simple gamma correction (brightness and contrast).
- Atmospheric corrections based on radiometric calibration of the sensor.
- Bidirectional Reflection Distribution Function (BRDF) corrections.
- Final Global Balance during the mosaicking phase.

Visual overview of image processing steps.



2. Orthorectification

Orthorectification is performed using the Leica XPro software, which uses a ray trace from a ground coordinate to the pixel. All resampling is performed using bi-cubic resampling to assure pixel location accuracy and avoids aliasing effects common to nearest-neighbor and even bilinear resampling techniques.

3. Mosaicking

Mosaicking encompasses the fundamental steps of (1) editing of artifacts and creating seamlines to “stitch” the orthoimages together and (2) balancing of the imagery to provide a consistent appearance of the imagery (color, tone, brightness, contrast, etc.) targeting the desired appearance established in the Pilot Project. All mosaicking is prototyped within the Grouping Tool environment, providing technicians a view of the final product before actual processing. Seamlines generated in the mosaicking process can be provided as a shapefile and are also a layer in Surdex’s web-based inspection tool (SurCheckSM).

The steps in mosaicking are:

- Editing of occlusion or smearing caused by rugged terrain.
- Specular correction, using shape files from imagery inspection.
- Seamline generation.
- Global balancing.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

- Seamlines do not cut through buildings, roads, overpasses, towers, etc. that would result in splitting or otherwise distorting the feature.
- Using the additional imagery over the tall buildings (greater than 6 stories), technicians will ensure the view exhibiting the least lean will be incorporated into the final product.
- The number of seamlines crossing roads is minimized to the maximum extent. If a seamline must cross a road, positions are selected to minimize cutting through any features.
- In general, seamlines are selected to follow linear and natural features, reducing as much as possible temporal and color differences.

Surdex will supply an ESRI shapefile that fully delineates the seamlines, automatically generated by custom software. Each orthoimage merged into the mosaic is defined by a polygon representing its bounds with each of its overlapping neighbors. The polygon attribution contained in the shapefile includes, at a minimum:

- Date of acquisition.
- Polygon start/end date/time.
- Spectral resolution (color, CIR, 4-band).
- Sensor make/model (e.g.: Leica ADS100) and serial number.
- Aircraft type and tail number (e.g.: C441, N2NQ).
- Average flying height.

Global and Block Balancing

Surdex's custom-developed balancing software eliminates any evident residual issues. This is handled by two functions:

- Block Balance fits correction models to each strip of images with a single simultaneous bundle adjustment.
- Global Balance corrects for local differences in illumination between strips. The results can be previewed without the need to generate intermediate files.

Tile Writing

During this step, all balance adjustments and seamlines are applied to the individual orthoimages to create the Master Tiles. Afterwards, the deliverable tiles can be generated and our custom software can create virtually any tile layout using automated batch processing. This includes support for:

- Overlapping and contiguous tile layouts.
- Multiple tile layouts.
- Creating tiles in other map projections and/or linear units (e.g.: meter vs. US Survey Foot).
- Since the Master Tiles are in 4x12 format, tiles can be delivered as such or remapped to 8 bits/pixel, and in 4-band, color, or color infrared (CIR) format.
- Supported output file formats include MrSID, GeoTIFF, JPEG, JPEG200, ECW, TIFF/TFW, etc.

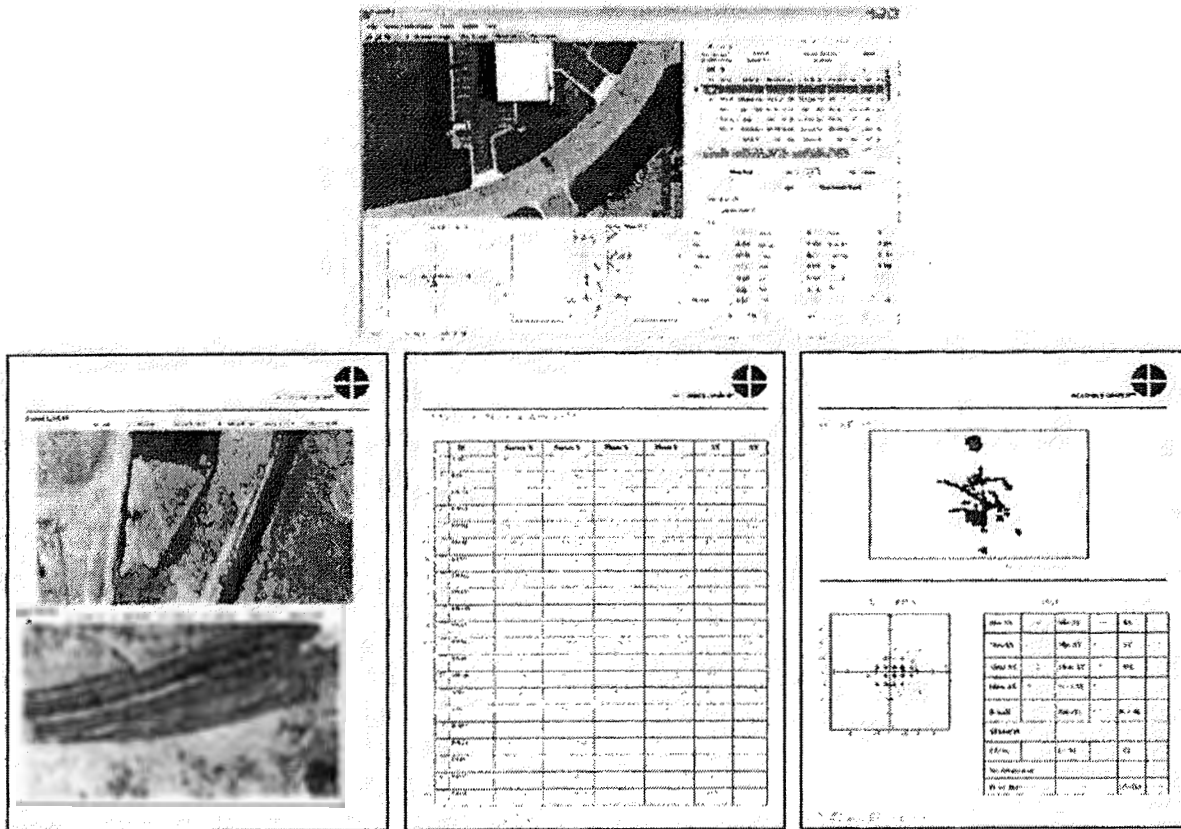
The Master Tile concept makes error correction during inspection very simple and comprehensive. Once an error is corrected in the Master Tiles, all applicable client tile layouts are automatically regenerated, potentially resolving numerous deliverable tiles.



J. ACCURACY VALIDATION

Accuracy validation is used throughout the orthoimagery production process, including the use of aerotriangulation points for interim checks. The Accuracy Analyst software from CompassData is used for formal validation. This software accepts ground point coordinates and guides the user through measuring points on each tile. It has extensive analysis and reporting tools that adhere to NSSDA specifications and guidelines and reports multiple measures of accuracy statistics.

Accuracy Analyst software.



K. ORTHOIMAGERY QUALITY CONTROL SYSTEMS

Surdex is committed to providing its services “first time right, on time.” Surdex has developed extensive Quality Assurance (QA) and Quality Control (QC) mechanisms for orthoimage projects. Accuracy and quality are thoroughly reviewed before delivery to our clients and Quality Control Systems processed are constantly under review and refinement.

Building upon achieving ISO Certification for specific geospatial products for the National Geospatial-Intelligence Agency, Surdex has instituted ISO processes internally to optimize our quality control and efficiencies.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

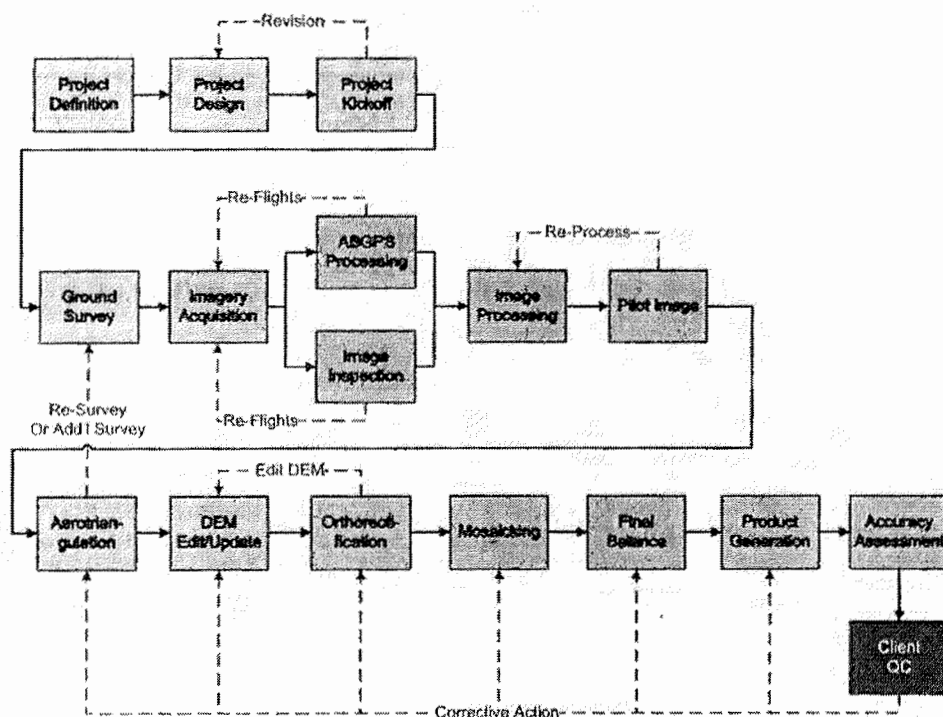
Summary of Quality Control Systems Phases and Approaches	
Phase	Approach
Project design	Internal design reviewed by Project Manager, Certified Photogrammetrist, and Registered Land Surveyor Reviewed by client
Ground survey operations	Field survey operations and processing under the supervision and review of a Registered Land Surveyor
Imagery acquisition	Updating of aircraft inspection, maintenance, and repair prior to and during project Updating of sensor calibrations if required Boresighting of sensors prior to use and/or after installation/re-installation Reporting of detailed progress by each aircrew at end of acquisition day Nightly updating of flight plans incorporating progress and results of inspection
Imagery inspection	Each image graded and reported in Enterprise database Inspection against the following factors, at a minimum: <ul style="list-style-type: none"> ■ Season window(s) and client start/stop work orders ■ Sun angle and/or timeframe specifications ■ Project specifications for ground conditions (flooding, smoke, haze, etc.) ■ ABGPS/IMU accuracy and quality ■ Camera misfires ■ Image motion/smear ■ Agreement with flight plans ■ Clouds/cloud shadow ■ Specular reflection noted for use by ortho technicians ■ Automated analysis of smear and/or occlusion in rugged terrain for use by ortho technicians
Aerotriangulation	ABGPS/IMU processing reviewed by a Certified Photogrammetrist / Registered Land Surveyor Tailored aerotriangulation reports for client review Dependent upon accuracy requirements, graded against such as: <ul style="list-style-type: none"> ■ Ground control, ABGPS/IMU, and image residuals ■ Agreement with check points ■ Distribution and placement of pass/tie points in final solution
Elevation modeling	Visual review Comparison of aerotriangulation points to the elevation surface to determine areas of change or problems
Ortho/mosaic	Ortho technicians inspect one another's work and perform edits Depending upon resolution of imagery, planimetric data such as roads, bridges, rail lines, buildings, etc. may be used to focus attention on seamline review/edit
Product QC	Use of pilot project(s) with client to assess: <ul style="list-style-type: none"> ■ Color, tone, balance specifications/expectations of client ■ Form and format of deliverables ■ Metadata compliance Accuracy analysis using AccuracyAnalyst



PROPOSAL
 48-16NOV18 PAQ | CS170285001-004 CONTRACTS
 Photogrammetric Mapping Products & Services

The following figure highlights the key steps in the orthoimagery process with red flow lines illustrating loop-backs in the process due to rejection/failure at a step.

Surdex's quality control system process overview.



L. SURDEX'S IMAGERY PREVIEW SERVICE

With years of web services hosting experience behind us on the USDA National Agriculture Imagery Program (NAIP) and with our web-based inspection tool, Suredex is in the unique position to offer clients a web-based imagery preview service. This service provides a visualization of acquisition progress and allows clients to assess whether ground and atmospheric conditions for acquisition were appropriate. This visual depiction is superior to textual reports and graphics of progress for many users and is accessible not only on desktop workstations, but also on most smart phones and tablets.

The service can be implemented as a username/password solution to control access or implemented as fully open access. If desired, the interim imagery can be also incrementally updated with the final imagery as production progresses, maturing into the final imagery service at the completion of the project.

Preview orthoimagery is automatically processed to default imagery metrics, suitable for assessing ground conditions, cloud/cloud shadow cover, flooding, snow/ice, fog, smoke, etc. If re-flights are conducted, their result will overwrite any previous imagery, resulting in a view of the most current situation. Suredex has demonstrated posting preview imagery within 5-10 business days of the date of acquisition.



PROPOSAL

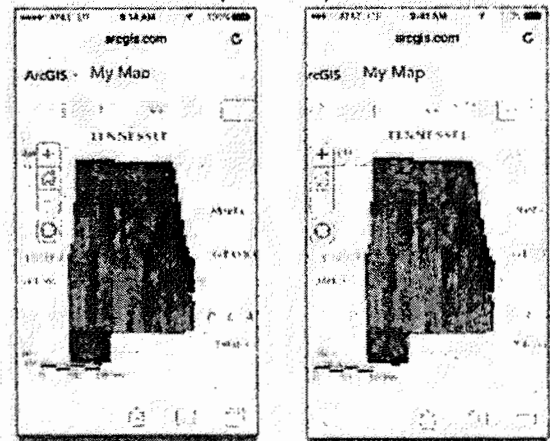
48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Preview Processing Compared to Final Product Processing		
Item	Interim	Final Product
Aerotriangulation	None performed. Based solely on ABGPS/IMU processing.	Aerotriangulation supported by ABGPS/IMU, ground control.
Orthorectification	To either existing (unedited) elevation surface or USGS NED.	To final (edited) elevation surface.
Accuracy	Generally 2-4X less accurate than final product.	To product specifications.
Image Processing	BRDF and atmospheric corrections applied. Default processing to basic image metrics/appearance.	Additional processing to desired final product appearance.
Mosaicking	Seamlines	Automated only.
	Balancing	Block balance only.

The preview imagery web service is an OGC-compliant WMS implementation:

- 4-band imagery viewable as natural color or color infrared (CIR).
- A vector overlay portrays the image bounds complete with acquisition time/date, aircraft tail number, camera make/model/serial number, etc.
- It is a REST (REpresentational State Transfer) service that can be viewed by a user in several ways, including but not limited to:
 - As an ArcGIS Java viewer for simple viewing.
 - Within ESRI ArcMAP.
 - Within ESRI ArcGIS.com.
 - Google Earth.

NAIP Imagery Preview Service on iPhone (Alabama).



M. SURDEX'S WEB-BASED INSPECTION TOOL (SURCHECKSM)

To assist our clients with the inspection of their orthoimagery, Surdex provides – *at no additional cost* – our web-based image inspection tool, SurCheckSM. This tool is the result of over five years of continuous improvement and has been met with outstanding reviews and benefited from user requests for enhancement. It is implemented in HTML5, JavaScript, php, and the ArcGIS API for JavaScript, providing flexibility for enhancements in the future.

SurCheck streamlines the inspection, remedial action, and delivery timelines. As call-outs are reported by reviewers, Surdex resolves each and notifies reviewers so they may confirm the correction. Since Surdex works off call-outs in parallel with the inspection process, it is common for reviewers to receive corrections within 1-2 weeks. When all call-outs are resolved for the project the data can be shipped on hard drives for final delivery. In many cases, clients choose to have orthoimagery added to SurCheck incrementally, further expediting inspection and allowing leveling of inspection resources.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

SurCheck™	
Feature	Benefit
Administrative	
Username and password login access.	Protected access for client and reviewers.
Client manager can assign reviewers to separate work zones within a project.	Multiple reviewers for each project to increase inspection rate and support multiple partners. Clients can assign multiple reviewers to specific work zones. Managers can view call-outs from reviewers to ensure a consistent approach.
Four (4) tiers of edit calls: 1. Standard inspector 2. Client manager 3. Surdex reviewer 4. Final client reviewer	Management of call-out resolution with appropriate levels of responsibility and authority within the client and within Surdex. Covers entire life cycle of inspection and resolution process, ensuring end product is fully inspected and accepted. Client manager can override client reviewers. Surdex reviewer dealing with disposition of a call-out (natural feature, out of scope, etc.).
Help menu for most options.	On-line assistance with operation reduces need for a manual or access to training guide, allowing session to continue uninterrupted.
General Interface	
Operates in Internet Explorer, Firefox, Chrome, Edge, and Safari. Works on smart tablets within individual interface limitations.	No browser plug-in required (prior versions required Silverlight). More flexibility for future enhancements requested by users or implemented by Surdex.
Single-page interface with no pop-up windows. Full-screen primary map window. Logical groupings of toolbars.	Simpler and cleaner interface. Maximizes screen real estate for viewing of larger areas. On-demand overview window.
Surdex-provided overlay of seamlines	Assists in searches for potential artifacts. Issues along seams or poor placement of seamlines are the most common problem found during inspection.
Ability for users to add their own map services.	Examples include historical imagery, vector overlays, control point overlays, parcels, ArcGIS Online layers, etc.
Swipe function with user-selectable layer.	Combined with user-added image services, provides a quick compare to historical imagery. Can swipe color and CIR renditions of 4-band products to review consistency and quality.
Magnifier window with adjustable zoom. Click and drag of magnifier box within window. Adjustable magnifier up to 9X, limited to 1:1 project resolution.	Quick toggling between magnifier and standard view allows reviewers to retain scale with close-up inspection of potential artifacts.
Generate graphical and quantitative histogram of current window, including: 1. Red, green, blue, NIR, and luminosity (red+green+blue). 2. Reporting of basic image metrics measures (contrast, clipping, brightness, etc.).	Aids in determining adherence to project-specific image metrics.
Progressive inspection of each tile in "snail trail" sequence. Simple acceptance of tiles any key press or mouse click. Accepted tiles are high-lighted.	Methodical approach streamlines inspection and portrays status.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Feature	Benefit
Save call-outs to a shape file or CSV files.	Export call-outs to non-SurCheck users for review. View within other applications (ESRI ArcMap, AutoCAD, etc.) CSV easily imported into Excel.
Measurement tool (points, distance, and area). User-selectable units (i.e.: feet, meters, miles, kilometers, etc.)	Supports investigation of call-outs against specifications (such as seamline shear, size of artifact, etc.).
Print current screen to printer or PDF.	Simplifies creation of samples, bug reporting, etc.

Upon request, Surdex can provide a video and PowerPoint presentation to familiarize and train users on the tool's use, as well as access to a sample project.

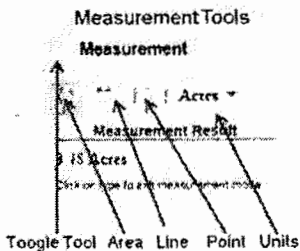
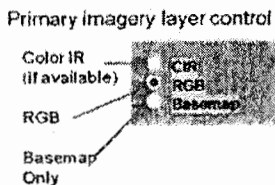
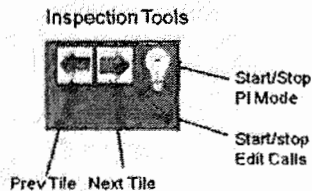
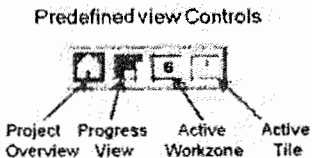
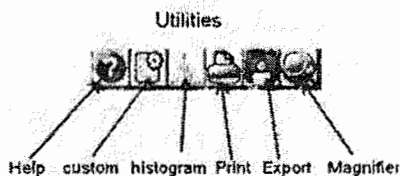
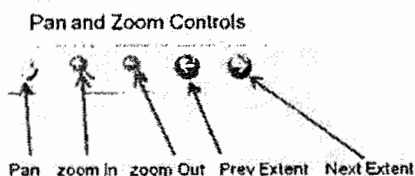
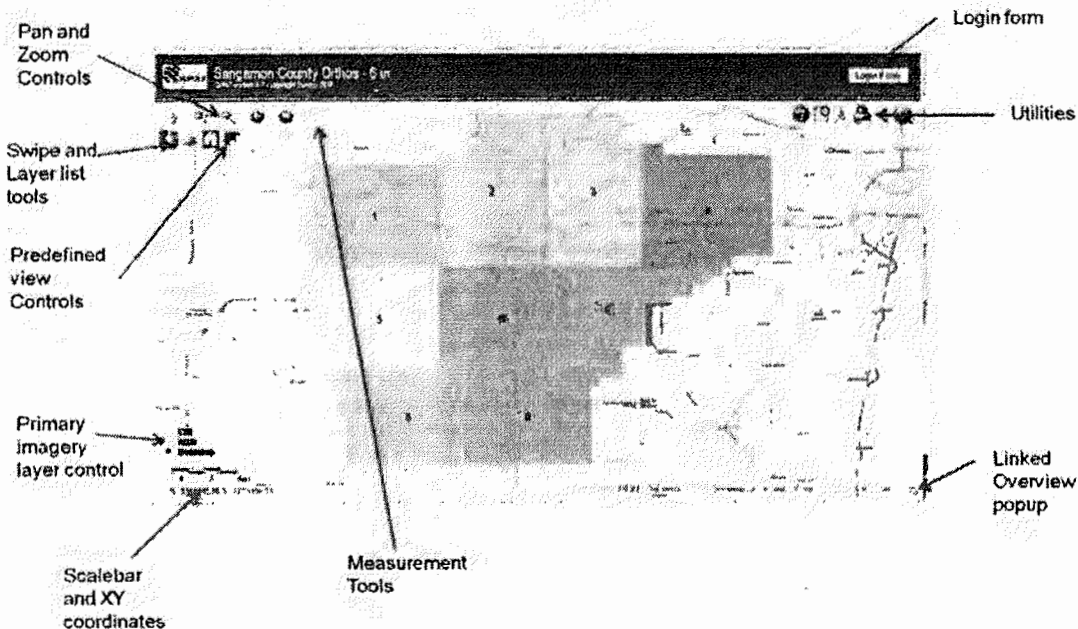
The following pages portray selected aspects of SurCheck.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

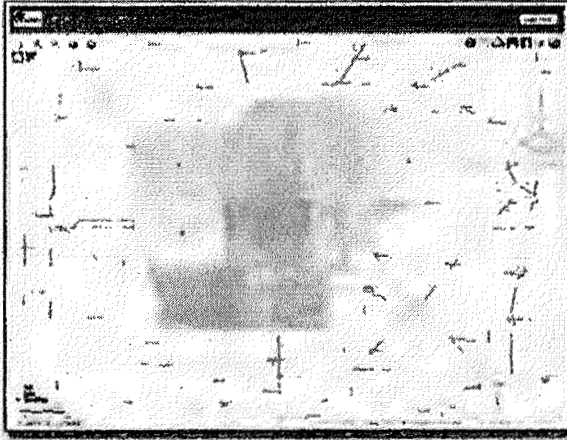
SurCheck layout and tools.



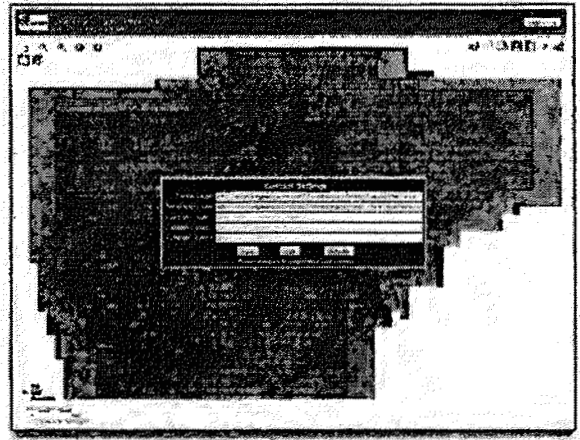


PROPOSAL
48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

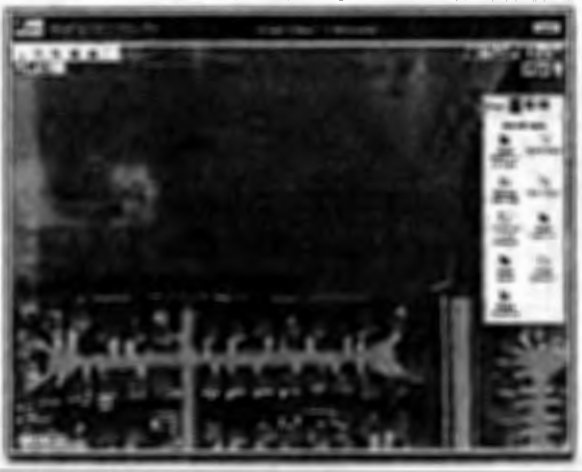
Initial Screen Showing AOIs.



Custom Settings Form.



Edit Calls Template.



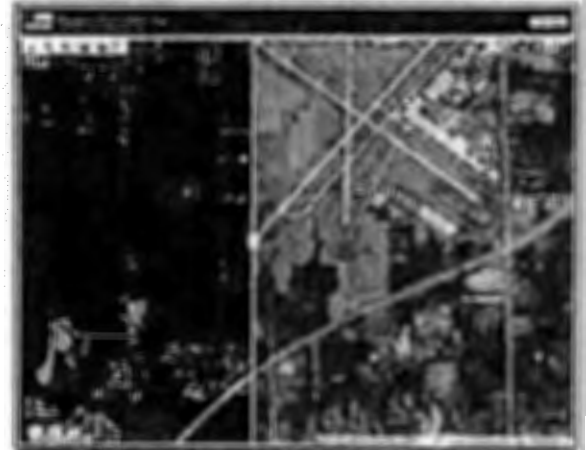
Edit Comments.



Swipe Between Color and CIR.



Swipe Between Color and ArcGIS.com Imagery.



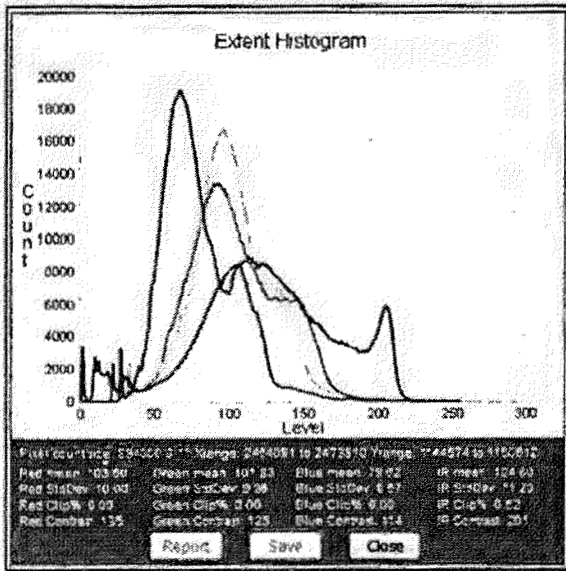


PROPOSAL
48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Manager call-out review



Histogram of View Extent.



Magnifier Tool.





PROPOSAL
48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Work Zone Progress.





PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

PART TWO: LIDAR ACQUISITION & PROCESSING

In the following pages, we have provided a description of the basic services provided on numerous LiDAR projects. As noted earlier, with four LiDAR scenarios, it is best to describe our LiDAR acquisition and processing processes in general. Upon award, both the acquisition plan and control layout can be determined to optimize the efficient collection of LiDAR data. Regardless of which scenarios are selected, the project deliverables will include (TBD) the point cloud, classified bare earth LiDAR, and hydro flattening to USGS specifications.

The following table presents our understanding of the four possible LiDAR scenarios for the project.

Summary of LiDAR Specifications		
Density / PPSM	Areas	Approximate Area
0.7 ppsm (QL2)	Boone County, MO	690 sq mi
0.7 ppsm	University of Missouri –MU Campus	4.8 sq mi
4 ppsm (QL2)		
10 ppsm (QL1)		

A. PROJECT DESIGN

When designing the project, Surdex includes:

- The buffered project area.
- Project specifications, such as points per meter, horizontal and vertical accuracies, and point classification schemes.
- Ground survey control and base station design.
- Preliminary LiDAR flight plans.

With several single engine aircraft suitable and available for LiDAR collection, and several twin-engine aircraft in reserve, Surdex has the capacity and flexibility to overcome a variety of unforeseen challenges during the acquisition window that may otherwise threaten temporal project objectives.

The following table is an example of specifications for the 0.7m posting.

LiDAR Design Specifications (Sample for 0.7m posting)	
Parameter	Value
Scan Angle/Field of View (FOV)	≤ 40° (+/-20° from Nadir)
Swath Overlap	30%
Flying height (AGL)	2,000 meters
Max laser pulse rate	273 KHz
Swath width	1,456 meters
Average point density	2.44 pts/meter ²
Average point spacing	0.64 meters
Vertical accuracy	<10 centimeters
Estimated ground speed	150 knots

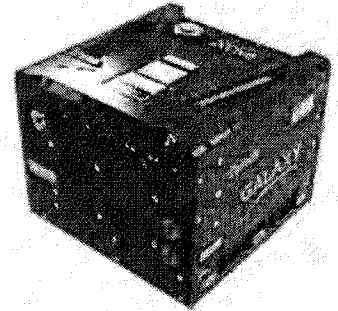


PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

1. Sensor: Teledyne Optech Galaxy LiDAR Sensor

Surdex owns three Optech Galaxy LiDAR sensors, one of the most advanced and efficient sensors available today. It uses innovative LiDAR technology enhancements and incorporated flight and calibration software for significantly increased sensor performance, collection efficiency, improved data quality, and a simplified collection process.



The Optech Suite of software includes FMS (Flight Management Software) and LMS (LiDAR mapping suite), both of which integrate with the Galaxy sensors. These systems facilitate superior mission planning and precise sensor calibration, allowing for exceptional vertical and horizontal point accuracies and industry-leading accuracy for surface derivatives.

Optech Galaxy Specifications	
Laser Configuration	
Topographic laser	1064-nm near-infrared
Laser classification	Class IV (US FDA 21 CFR 1040.10 and 1040.11; IEC/EN 60825-1)
Beam divergence	0.25 mrad (1/e)
Operating altitudes (1,2,3,4)	150-4700 m AGL, nominal
Effective pulse repetition frequency	Programmable, 35-550 kHz
Laser range precision (5)	< 0.008 m, 1 σ
Scan angle (FOV)	Programmable, 0-60°
Swath width	Programmable, 0-115% of AGL
Scan frequency	Programmable, 0-120 Hz advertised (0- 240 scan lines/sec)
Sensor scan product	2,000 maximum
Absolute horizontal accuracy (2,3)	1/10,000 \times altitude, 1 σ
Absolute elevation accuracy (2,3)	< 0.03-0.20 m RMSE from 150-4,700 m AGL
Sensor Configuration	
Position and orientation system	POS AV™ AP60 (OEM); 220-channel dual frequency GNSS receiver; GNSS airborne antenna with Iridium filters; high-accuracy AIMU (Type 57); non-ITAR
Flight management system	Optech FMS
SwathTRAK™	Dynamic field of view
PulseTRAK™	Continuous operating envelope
Range capture	Up to 8 range measurements, including last
Intensity capture	Up to 8 intensity returns for each pulse, including last (12-bits/pixel)
Roll compensation	Programmable; $\pm 5^\circ$ at 50° FOV; increasing as FOV is reduced from 50°
Minimum target separation distance	< 0.7 m (discrete)
Data storage	Internal solid state drive SSD (SATA II)
Power requirements	28 V; 300 W; 12 A
Dimensions and weight	Sensor: 0.34 \times 0.34 \times 0.25 m, 27 kg — PDU: 0.42 \times 0.33 \times 0.10 m, 6.5 kg
Operating temperature	0 to +35°C



PROPOSAL

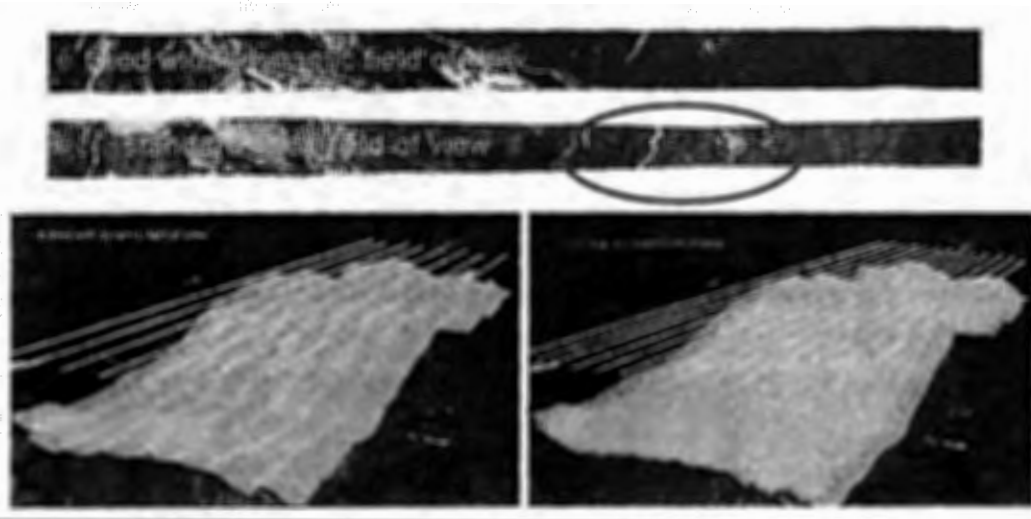
48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Optech's cutting edge PulseTrak and SwathTrak technologies not only enable the sensor to collect data with elevated precision and efficiency, but also simplify and improve collection in challenging terrain.

PulseTrak overcomes widely recognized industry challenges by allowing for an altitude-independent continuous sampling envelope that minimizes coverage gaps and density variations often associated with an inability to effectively track coincident laser pulses in the air. The end result of collection is consistent data which improves the efficiency of all subsequent processes in the LiDAR life-cycle and minimizes costly reflights.

Optech's exclusive SwathTrak technology dynamically varies the field of view (FOV) in real time during acquisition to remove the effects of terrain relief on swath width and maintain consistent overlap between swaths. The effects of SwathTrak technology are illustrated in the graphics below, which demonstrate the acquisition efficiency challenges posed by high relief survey areas. The Galaxy is the only system on the market today with a dynamic FOV capability, giving Surdex a distinct advantage in LiDAR collection.

The second major benefit of SwathTrak is efficiency. In areas of extreme relief, the sensor can achieve as much as a 40% reduction in the number of flight lines, resulting in a lower acquisition cost. The consistent overlap and point density achieved by utilizing SwathTrak also greatly simplifies and improves the result of many post-processing steps, including line-to-line relative accuracy adjustments. These advantages are ultimately passed on to the customer in the form of higher quality deliverables and final products, produced at a lower cost.



Sensor Parameters (SwathTrak capabilities)		
SwathTrak	Without	With
Laser PRF (effective)	500 kHz	500 kHz
FOV	Fixed 30°	Variable 18-42°
Sidelap	50%	20%
Swath Width	530-925 m	750 m
No. of Flight lines	13	8
Time On-Line	0:41:51	0:26:31
Total Time	1:41:51	1:01:31

A large advantage of the Galaxy sensor is the smooth surface repeatability. With such a low SSR (~3cm) we are able to align neighboring swaths of data with extreme accuracy. We are also able to more accurately and consistently adjust our datasets to surveyed control. Melding neighboring swaths and control so tightly together allows for a high level of confidence in control reports and reporting RMSE values.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

2. LiDAR Ground Survey

The control points established for the imagery will be utilized for the LiDAR acquisition, planned in conjunction with the imagery, to ensure accuracy is met most efficiently.

All field notes and observation logs will be neatly kept and indexed. These include notes pertaining to the establishment and/or extension of control. For recovered points, information on the condition of each point will be provided in the notes. The observation logs for each point will include (1) all information pertinent to the recovery, and (2) observations required for reduction.

Check points will be collected per the required distribution for non-vegetated vertical accuracy (NVA) and vegetated vertical accuracy (VVA) validation. Our current plans are based on a single season collection of the LiDAR data, reducing the need for additional check point collection due to temporal change. Check point surveys will tie to NGS monuments used for the base control surveys.

3. Sensor Calibration

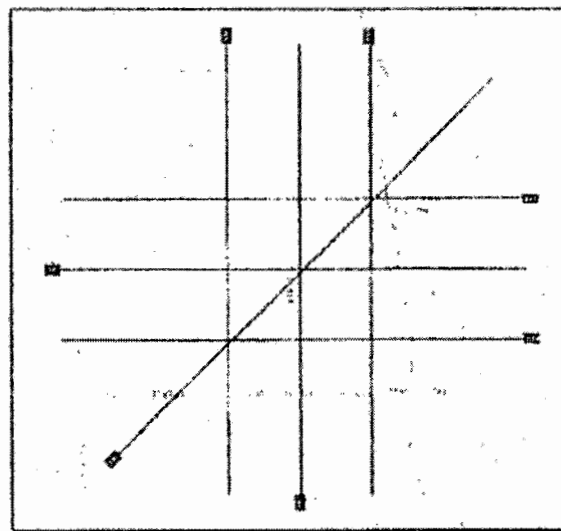
Aerial LiDAR acquisition is highly dependent on several sensor sub-systems working in conjunction with each other to produce accurate ranging data and the resulting point cloud. These include the Base GNSS station, ABGPS/GNSS, IMU and the physical laser unit. Surdex's LiDAR system is routinely calibrated over our established boresight at our base of operations in Chesterfield, Missouri.

Surdex's procedure to calibrate the Galaxy sensor consists of six lines of acquired data flown in altitude crosshatched pattern, with an additional seventh line flown at an oblique angle to the grid. This vendor-recommended calibration pattern reliably analyzes the behavior of the sensor and adjusts the sensor model calibration parameters to produce consistently accurate data. Recognizing that each project is unique, Surdex executes a sensor calibration on each sensor at the onset of every project using project specific settings.

These additional steps ensure that maximum efficiency is achieved during all post processing procedures. This calibration procedure is conducted following the installation of the sensor in an aircraft and anytime there are large temporal differences within the project collect.

A secondary method of boresight validation is conducted on site throughout the project acquisition. This secondary method consists of cross flight lines, perpendicular to the project lines, which are then processed with production lines as a means of sensor validation.

Calibration approach.





PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

B. ACQUISITION

As noted earlier, acquisition planning is dependent on the final project scope and project area. Once these are determined, Surdex will develop flight lines that utilize the control points established for the imagery in order to optimize cost efficiency. The acquisition process follows, in general, the procedure for imagery acquisition. Different flight heights will be established for the varied requested points-per-square-meter (ppsm) density and QL1 / QL2 data.

Surdex will base the mobilization schedule on current and forecast weather conditions and verified environmental conditions. Conditions required for LiDAR collection include:

- Cloud, fog and smoke free (between aircraft and ground).
- Snow free (light snow may be acceptable with approval).
- Stream and rivers within normal levels (flood free).
- Leaf off vegetation.

Should crews leave the project site due to extended unfavorable weather/ground conditions, notification will be sent detailing the reason for leaving the project site and Surdex's estimated re-mobilization date.

Surdex will provide progress reports daily with flight trajectories, GPS reports and identify any days where collection was delayed due to weather or other environmental factors.

Two base stations will be identified in advance and will be located as close as possible to the center of that day's collection area. The base station locations will incorporate existing NGS locations whenever possible. If necessary, extra field personnel will be deployed should a base unit be required inside an AOI rather than the nearest airport.

The results from the processed base station data, GNSS data and the GPS surveyed ground control data will be used to create an accuracy report for each site within the project and the project as a whole once it is complete.

1. Post-Acquisition Data Verification

As daily shipments of the LiDAR data arrive, they are immediately backed up to ensure a complete set of the raw data that was collected will always be available. This serves to secure all data in its native form should it be necessary for review or investigation during subsequent processing. After archival, the initial QC is accomplished on a daily basis. The data is inspected for coverage, continuity and general acceptability. Should an issue be found that requires re-flight, the anomaly is entered into our flight database as a "rejection" and notification sent to the Project Manager, Flight Manager and field crews automatically. The automatic notification eliminates the dependence on human interaction to report an issue. As stated previously, all re-flights are labeled as priority status requiring prompt attention and ensuring as little temporal difference as possible in an effort to avoid issues commonly associated with changes in the ground surface due to development, flooding, and changes in vegetation.

Data will be inspected to ensure the nominal point density has been achieved, intensity values are acceptable, overlap is consistent as planned and unjustified data voids are not present. Inspection will verify that proper planning, acquisition, and sensor function have achieved the desired results.

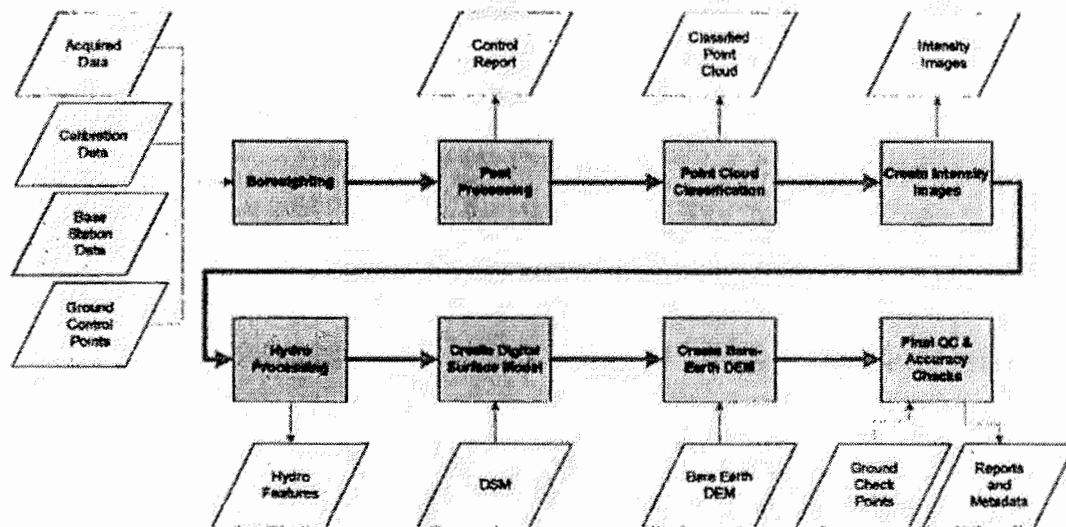


PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

2. Processing Approach

The following graphic portrays Surdex's general process flow for a typical LiDAR project, addressing all possible deliverables. The following sections address each of the process steps.



3. Boresighting

This step is executed for each project and each sensor involved in collection. We fly a 7 line (3x3x1) pattern with a large amount of overlap allowing LMS software to solve for any discrepancies both intra- and inter-swath. This ensures the data being produced and processed is as accurate as possible both relatively and absolutely.

The Optech LiDAR Mapping Suite (LMS) software is used to produce relatively adjusted and absolutely accurate 3-dimensional LiDAR point clouds by combining the raw range data collected in the field, relevant meteorological data, and onboard GPS and IMU information. However, adjacent lines, lifts, or blocks may occasionally require an additional relative adjustment to align the point clouds associated with each line and/or account for systematic error. Long lifts and lifts that are divided to avoid undesirable conditions (clouds or anomalous ground conditions) tend to be more likely to require post-processing adjustments. Conversely, maximum efficiency in post-processing is often achieved when lines are unsegmented and short.

TerraMatch is a least squares adjustment function contained within the TerraSolid LiDAR production software suite. This software allows the operator to perform retroactive time-based calibration of the LiDAR sensor to correct for mismatched data observed in the produced points. Calibration parameters surface matching adjustments within overlapping areas of LiDAR data to overcome time-dependent sensor anomalies. First, areas covered by overlapping LiDAR flight lines are processed to identify planes in each flight line that are candidates for possible matching. These offset planes are then manually examined and filtered to ensure veracity. Finally, surfaces are measured and processed to adjust the LiDAR sensor parameters, such as changes in position and/or attitude, and the time dependent variability of these parameters. Once resolved, these adjusted parameters are applied to each flight line, producing relatively accurate points.

When data does not meet relative accuracy specifications out of LMS, the affected lines can be evaluated in TerraMatch. Several areas will be identified, and an initial visual review of the point cloud is performed to characterize the nature of the differences.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Once the best TerraMatch solution is found, proprietary Surdex software is used to interactively select and rapidly apply the corrections to mismatched areas of swaths. Once a mission, or multiple missions, has been relatively adjusted, an absolute adjustment against the survey control is computed and applied. The most prevalent corrections are for roll, pitch, or heading. Once corrected through the TerraMatch procedure, the corrections produce well-fitting lines both horizontally and vertically in the overlap areas.

4. Post Processing

When a pre-determined block of data from each lift has been collected and has passed initial QA, it is assembled within LMS and processed. This helps reduce the need for third party adjustment software by solving for solutions and resolving them using the sensor models designed by the hardware manufacturer.

It is within this process that the GNSS data is combined with the collected sensor data and the sensor model to output a production ready point cloud. The data is created in the deliverable projection and the accuracy evaluation begins.

5. Point Cloud Classification

The LiDAR scenarios specified in the RFP are all for bare-earth (BE) classification. Although classification schemes vary for each project specification, the table below *typifies* a bare earth classification scheme. The final scheme will be determined during the project kickoff.

The TerraScan software is used to run automated classification routines that have been refined through years of practical experience among many different densities and datasets. Several macros (filter algorithms) may be employed to address variances in terrain, human development, and scene morphology to obtain high-yield results and minimize the effort of manual terrain editing.

Although classification schemes vary for each project specification, the following table typifies a bare earth (BE) classification scheme. The final classifications will be determined during negotiations.

The steps of LiDAR point cloud classification will be performed are described below:

- **Automated classification:** Automated filtering macros will address all classifications required.
- **QA/QC of automated classification:** A thorough QA/QC is necessary at this point during which technicians review and correct gross misclassifications in each tile. Some manual editing is required to achieve the classification accuracy. There have been some improvements in automated filtering macros in software such as Terrscan, but automation cannot account for every possible scenario and feature combination.
- **Dense Vegetation** A good automated filter will do a relatively sound job of retaining subtle ground features such as berms, banks, and ditches. However, the filters may not perform as well in areas obscured by dense vegetation or other above ground features. When terrain is "shaved" out of the ground class, this requires manual intervention to correct.

Point classification scheme (LAS 1.4)		
Code	Definition	Comments
0	Created, never classified	Not delivered
1	Processed, unclassified	
2	Ground (bare earth)	
3	Low vegetation	
4	Medium vegetation	
5	High vegetation	
6	Building	
7	Low noise	
8	Reserved	
9	Water	Hydro only
10	Ignored ground (near breakline)	Hydro only
11	Road surface	
12	Reserved	
13	Wire – guard (shield)	
14	Wire – conductor (phase)	
15	Transmission tower	
16	Wire – structure connector	
17	Bridge deck	
18	High noise	
18-63	Reserved	
64-255	User definable	



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

Photogrammetric Mapping Products & Services

- **Buildings vs vegetation** can require extensive manual editing, especially in areas where the two features are overlapping. Even with advanced filtering, automation may become confused by vegetation that is touching or is in close proximity to building rooflines. A building filter may also “see” what appears to be a planar feature in dense forest/vegetation and classify these points as building.
- **Water features:** Once classification of the LiDAR points is completed, technicians collect the hydro-flattening breaklines. Water is automatically classified using the completed hydro-flattening line work. This method ensures that the hydro-flattening line work and the water classification match in all areas of the project.
- **Final QA/QC of classification:** A final QA/QC is conducted of the classified, all-return point cloud tiles once all classification and hydro finishing are complete. During this review, technicians will visually QC and complete any additional manual edits necessary to correct any remaining classifications issues. This includes a comprehensive manual edit of classifications to ensure accuracy.

C. HYDRO PROCESSING

Surdex’s process, developed and refined through years of experience, includes both manual and automated procedures. Our R&D staff has developed software to assist and improve efficiency in the hydro-enforcement process.

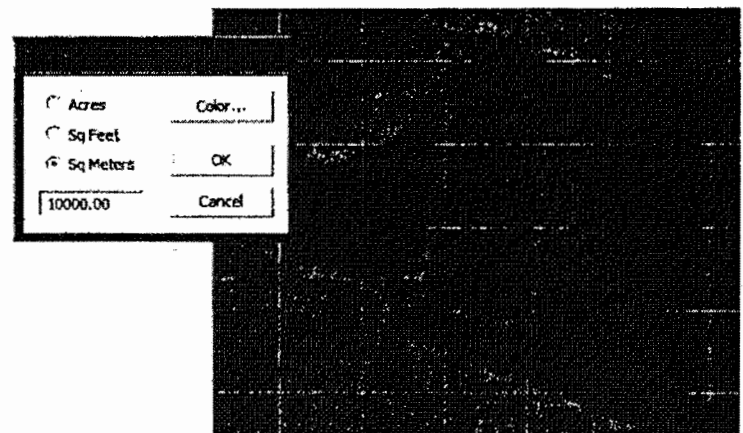
Several sets of data are used to assist technicians develop the hydro-enforcement breaklines. These include LiDAR data, color hill-shade maps derived from the LiDAR data, National Hydrographic Dataset, and intensity images.

Breakline collection will be conducted using custom tools which allow technicians to select specific line types such as river bank and islands as well as polygon types such as lakes and ponds. The interface gives technicians the flexibility to show the object vertices as they are drawing, constrain the line work to a fixed elevation or to use min/max/mean methods of determining elevations. Using a profile view, technicians may also elect to choose an elevation based on their interpretation of the river bank.

Pond and lake features will be collected at one elevation representing the mean elevation of the feature, at the time of flight, where it meets the bank around the edges. To ensure that only one elevation value is present on the pond/lake polygon, the technician is able to lock in the elevation value as they are drawing.

Our custom software contains a tool specifically designed to assist the technician in determining if an island or pond feature meets the minimum collection criteria. By utilizing this tool, technicians are able to apply a grid sized to the minimum unit required allowing quick identification of features that should be collected.

Overlay of 1 Hectare Minimum Map.Unit.



Rivers and streams are initially collected in 2D to ensure that the line work is uniform in the x and y with the edges of river banks. Technicians then set a starting elevation at the head of the water feature and an ending elevation at the end of the water feature. This ensures that a proper starting and ending elevation is determined. The bank lines are then buffered, reclassifying ground points that are directly on or immediately next to the lines. This prevents the line work from following the precise up and down elevation changes from point



PROPOSAL

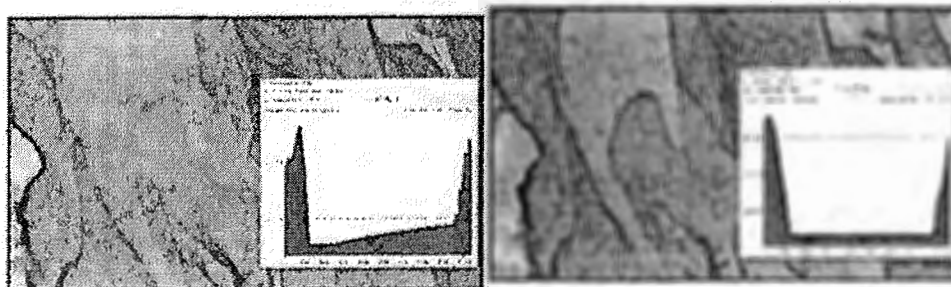
48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

to point. While these minute elevation variations in LiDAR could be within the acceptable vertical accuracy threshold of the project, they may still adversely affect the ability of the line work to “flow” downhill properly.

Once the line work has been buffered, technicians revisit the entire length of the water feature, inspecting the elevations to ensure they match the LiDAR ground class. Using the hydro feature collection tool, technicians are able to view the elevations of all vertices to check that they present gradient downhill values (enforced monotonically) and to ensure that the feature is flat from bank to bank.

As a final check of the hydro breaklines, technicians are able to generate a Triangulated Irregular Network (TIN) surface on the fly that incorporates the ground surface and the line work. Thus, this process ensures that the line work will properly hydro-flatten the surface. This final check: (1) eliminates costly errors that could be caused by erroneous line work identified at the end of the process, and (2) allows technicians to make corrections while collecting the line work.

Before (left) and after (right) hydro flattening



Surface Model (DSM)

1. Create Digital

The completed and quality-verified classified all-return LiDAR point cloud is used to develop the DSM. The first return of each point, excluding noise, withheld and overlap are used to create a dataset that has the same tile layout as established with the DEM. This dataset is then used by a combination of Surdex and Terrasolid software to create a 32-bit ERDAS .img raster file.

All tiled DSMs will then be reviewed for quality, artifacts, format, and spatial alignment and naming convention according to the project specifications.

Example of Surdex DSM. Surdex's internal tiling scheme cuts tiles for seamless appearance.





PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

2. Create Bare-Earth DEM

The completed and quality-verified classified all-return LiDAR point cloud and hydro-flattening breaklines are used to develop the bare-earth DEM.

The first step in this process will be to create an entry in Surdex's Enterprise Geodatabase that will house the applicable data. A Feature Dataset will be established that follows the Spatial Reference Framework. The LiDAR LAS files are converted to a singular Multipoint Feature Class, where the ground class is extracted from the LAS file and imported into the Feature Dataset. Hydro-flattening breaklines will also be merged and imported into the same Feature Dataset. During the next step, the DEM tile extents will be buffered by 50 meters on all sides of the tile with 90 degree corners. The geographic corners and side midpoints will be used to establish a minimum bounding rectangle that serves as the basis for the buffering of the tile. Once all of the buffered tiles have been created, they will also be stored in the Enterprise Geodatabase containing the Multipoint LiDAR data and hydro-flattening breaklines. The buffered DEM tiles will then be dissolved to create a Project Clip Boundary. This boundary will serve as the maximum processing extent for the DEM creation.

An ESRI Terrain Dataset will then be compiled using the multipoint LiDAR data as embedded masspoints, the hydro-flattening breaklines, and the project clip boundary. This terrain building process will ensure a seamless topographic surface that will eliminate artificial artifacts, seaming, gaps, stepping, and quilting. Once the project wide terrain is built, it will be processed using the pre-established buffered DEM tiles to create exact extent matched DEM tiles that will be stored as hydro-enforced 32-bit floating point raster DEMs.

All tiled DEMs will then be reviewed for quality, artifacts, format, and spatial alignment, shifting, and naming convention according to the project specifications.

At the project kick-off meeting, Surdex and the Client will determine the deliverable product for this phase. The following list itemizes standard parameters; these will be finalized during negotiations.

- DEMs will be hydro-enforced, in 32-bit floating point raster to the nearest 0.01 m.
- A 50 meter buffer will extend on all sides of each tile.
- Tiles will have 90 degree corners.
- No seams, stepping, gaps, or quilting shall be visible unless naturally occurring.
- No artifacts shall be present that should not be in the bare ground class.
- There shall be no over-aggressive or under-aggressive filtering resulting in degraded DEM quality (such as low vegetation present in the ground class or "shaved" terrain features).
- Depression sinks will not be filled in.
- Acceptable data voids inside the project area and voids outside of the project boundary shall be coded as NODATA (-32767).

3. Final QC and Accuracy Checks

Surdex is at the forefront of technology and production. All steps of the data processing phase are subject to our Adaptive QA/QC system which consists of processes and tools developed as a result of years of experience. The Adaptive QA/QC system consists of "living" documents that are updated and improved constantly, based on client and project stakeholder feedback and lessons learned. This approach allows us to quickly address issues such as those caused by rapidly evolving technologies.

Surdex ensures the hardware and collection settings are in full compliance with accuracy standards, before each collect, and any time there is significant off time between collects, we routinely fly a seven line pattern and calibrate our instrument settings.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

Our Quality process begins with our initial QA – looking at actual point clouds (created as soon as the next day) to assure the collect was done under favorable conditions and the equipment is fully functional.

The absolute and relative accuracy are rigorously examined prior to any manual classification, ensuring we mitigate any time loss prior to manual editing. Having full confidence that the data meets and exceeds acceptable standards is of the utmost importance before beginning classification.

Surdex continually adheres to and improves upon peer and independent reviews throughout processing.

- An independent, differentially collected GPS base-station coordinate used to review Surdex's processed coordinates gives us full confidence moving forward.
- It is imperative to compare the trajectory to an independently produced trajectory to assure there are no major offsets; this step eliminates time-intensive, costly rework and its impact on schedules.
- Rigorously examining the relative accuracy to ensure specification is met is the only way to be confident that the data is of a high quality.
- The absolute accuracy is of the utmost importance to the overall quality of the dataset by ensuring the LiDAR hardware is both accurate and consistent with its collection.
- Manually reviewing the classified data allows for a QC of the automated classification schema, and Surdex provides an additional assurance by incorporating a peer review to ensure classification consistency across analysts.

Having a series of checks and balances gives Surdex and the client the utmost confidence that the data being produced is of the highest quality.

At the conclusion of a project, Surdex provides a full LiDAR accuracy report including project overview, process and QA/QC description addressing all NDEP/ASPRS procedures and requirements. Accuracy check points are used that are:

- Independent of the points used in production.
- At an accuracy equal to or better than the target product accuracy.

The location of the control points will be determined by evenly distributing them over the project area. We will select control points at key locations in the AOI and along flight lines.

In addition to project control, Surdex will survey checkpoints for internal QC of the project accuracy.

The accuracy report provides documentation of project specifications, control and check point descriptions and photos. In addition to written descriptions, project graphics are used to illustrate AOI's and GPS survey locations. To support accuracy reporting, an Excel spreadsheet is provided listing all survey positions including individual points, land cover types and final accuracy results as charts in the Project Summary Report.



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

PART THREE: TOPOGRAPHICS / PLANIMETRICS

A. TOPOGRAPHIC MAPPING

The third part of your request is for topographic / planimetric mapping within the University of Missouri project area of 4.8 square miles. This section discusses the development of 2' contours, using the LiDAR data from this project, plus collection of planimetric roofline elevations.

Contours can be generated several different ways:

- A LiDAR-only approach.
- A photogrammetric-only approach.
- A combined LiDAR and photogrammetric approach.

The decision as to which approach would be used depends partly on accuracy and partly on the density of the LiDAR data and/or resolution of the photogrammetric imagery.

When creating contours from LiDAR, Surdex has defined various levels of contour datasets that reflect common practices, intended usage, and level of effort. The following table defines these levels which range from Level 1 (automatically generated contours) to Level 4 (intended for precise datasets usable for engineering efforts).

Surdex is anticipating the LiDAR will be part of the scope of your project. If this comes to fruition, we recommend Level 3 Contours from LiDAR as the best values. This is also what is priced in the pricing section.

Contour from LiDAR Dataset Levels				
Feature	Level 1	Level 2	Level 3	Level 4
Contour Index text	Yes	Yes	Yes	Yes
Attributes for depression contours	Yes	Yes	Yes	Yes
Cartographic edit (text and contours)		Yes	Yes	Yes
Hydrographic breaklines			Yes	Yes
Stereo-compiled breaklines				Yes
Planimetric features (optional)				Yes



PROPOSAL
 48-16NOV18 PAQ | CS170285001-004 CONTRACTS
 Photogrammetric Mapping Products & Services

The following examples illustrate the quality of each Level over the same area.



Level 1

- Automatically generated from LIDAR.
- No manual editing.



Level 2

- Manual editing.
- Anomalies resolved.
- Smoothing.



Level 3

- Begins with Level 2 dataset
- Breaklines from LIDAR surface.
- Hydrologic enforcement.
- Aggressive cartographic editing.



Level 4

- LIDAR and/or photogrammetric DTM source.
- Stereocompilation.
- Highest level of breaklines and cartographic editing.
- Planimetric data is optional.





PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

Photogrammetric Mapping Products & Services

For the purposes of this document, we are presuming that LiDAR will be collected and that it will be the source for the topographic mapping. (The alternative is that contours are generated by photogrammetric compilation.) We are suggesting and have priced Level 3 contours on newly acquired LiDAR. If the LiDAR option is not selected, the scope and cost of generating contours will need to be revisited and negotiated.

B. PLANIMETRIC MAPPING (ROOFLINE ELEVATIONS)

The planimetric mapping work for this project is for roofline elevations only (no feature collection is referenced in the RFP). During final negotiations, Surdex will discuss the options for this aspect based on whether elevation is based on LiDAR data or by imagery with stereo compilation.

If other planimetric feature collection is desired by any of the participants, Surdex has complete in-house capabilities to undertake full planimetric mapping.



Forms and Certifications

WORK AUTHORIZATION CERTIFICATION

PURSUANT TO 285.530 RSMo
(FOR ALL BIDS IN EXCESS OF \$5,000.00)

County of St. Louis)

)SS.

State of Missouri)

My name is Katie Funkhouser. I am an authorized agent of Surdex Corporation (Bidder). This business is enrolled and participates in a federal work authorization program for all employees working in connection with services provided to the Agency. This business does not knowingly employ any person that is an unauthorized alien in connection with the services being provided. Documentation of participation in a federal work authorization program is attached hereto.

Furthermore, all subcontractors working on this contract shall affirmatively state in writing in their contracts that they are not in violation of Section 285.530.1 and shall not thereafter be in violation. Alternatively, a subcontractor may submit a sworn affidavit under penalty of perjury that all employees are lawfully present in the United States.

Katie Funkhouser 11/14/2018

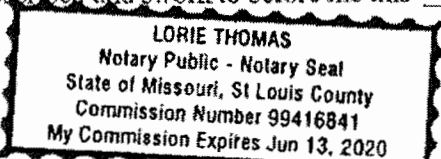
Affiant

Date

Katie Funkhouser 11/14/2018

Printed Name

Subscribed and sworn to before me this 16 day of November, 2018.



Lorie Thomas
Notary Public

Attach to this form the first and last page of the E-Verify Memorandum of Understanding that you completed when enrolling for proof of enrollment.



Last page of the E-Verify Memorandum of Understanding

E-Verify



Company ID Number: 183875

To be accepted as a participant in E-Verify, you should only sign the Employer's Section of the signature page. If you have any questions, contact E-Verify at 888-464-4218

Employer: Surdex Corporation

Robert Berger

Electronically Signed

8/12/17 01:04

Department of Homeland Security - Verification Division

USCIS Verification Division

Electronically Signed

1/23/18



PROPOSAL

48-16NOV18 PAQ | CS170285001-004 CONTRACTS
Photogrammetric Mapping Products & Services

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION LOWER TIER COVERED TRANSACTIONS

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 29 CFR Part 98 Section 98.510, Participants' responsibilities. The regulations were published as Part VII of the May 26, 1988, Federal Register (pages 19160-19211).

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS FOR CERTIFICATION)

- (1) The prospective recipient of Federal assistance funds certifies, by submission of this quotation, that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- (2) Where the prospective recipient of Federal assistance funds is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this quotation.

Ronald C. Hoffmann, President

Name and Title of Authorized Representative

Signature

November 16, 2018

Date

**PROPOSAL**

48-16NOV18 PAQ | CS170285001-004 CONTRACTS

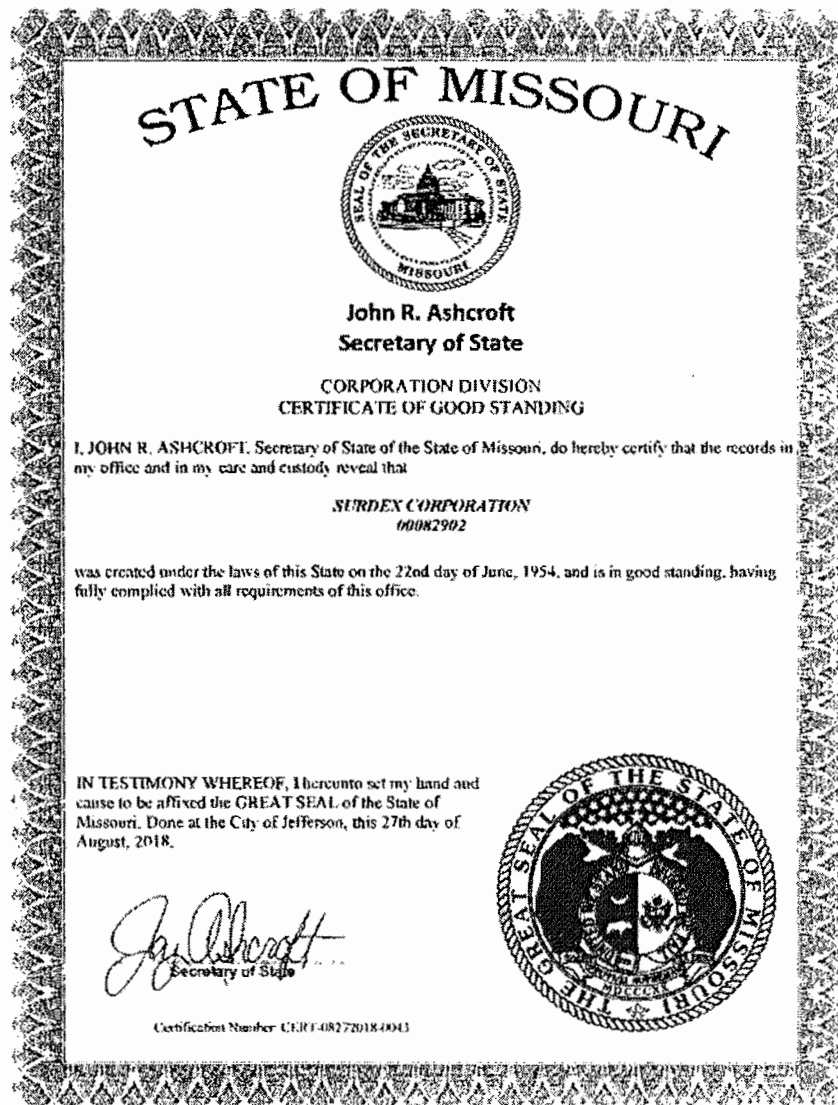
Photogrammetric Mapping Products & Services

LICENSES, CERTIFICATIONS, ACCREDITATION, AND/OR PERMITS

Name of Firm	Surdex Corporation
Business Address	520 Spirit of St. Louis Blvd. Chesterfield, MO 63005-1002 United States
Contact	Ron Hoffman, President

Certificate of Good Standing

Missouri Incorporation No.	0082902
Type Ownership	S-Corporation
FEIN	43-0690641
Year Established	Est. 1954, Missouri





NOTICE OF CONTRACT RENEWAL

State Of Missouri
 Office Of Administration
 Division Of Purchasing
 PO Box 809
 Jefferson City, MO 65102
www.oa.mo.gov/purch

Air
RFPS 30034901700285

CONTRACT NUMBER CS170285002	CONTRACT TITLE Photogrammetric Mapping Products and Services
AMENDMENT NUMBER Amendment #001	CONTRACT PERIOD September 15, 2018 through September 14, 2019
REQUISITION/REQUEST NUMBER N/A	SAM II VENDOR NUMBER/MissouriBUYS SYSTEM ID 4306906410 1/ MB00048428
CONTRACTOR NAME AND ADDRESS SURDEX CORPORATION 520 SPIRIT OF ST LOUIS BLVD CHESTERFIELD, MO 63005	STATE AGENCY'S NAME AND ADDRESS State of Missouri Various Agency Locations
ACCEPTED BY THE STATE OF MISSOURI AS FOLLOWS: The State of Missouri hereby exercises its option to renew the contract. All other terms, conditions and provisions of the contract, including all prices, shall remain the same throughout the above contract period and apply hereto. SIGNATURE OF CONTRACTOR IS NOT REQUIRED ON THIS DOCUMENT.	
BUYER Jacqueline Satterlee	BUYER CONTACT INFORMATION Email: jacqueline.satterlee@oa.mo.gov Phone: (573) 751-4085 Fax: (573) 526-9816
SIGNATURE OF BUYER <i>Jacqueline Satterlee</i>	DATE 6/22/18
DIRECTOR OF PURCHASING <i>Karen S. Boeger</i>	
Karen S. Boeger	

PURCHASING

CONTRACT AMENDMENT ROUTING GUIDE JS CS170285002A A# 001

Revised 08/17/15

RENEWAL: 1 PERIOD OF 2 TOTAL

Renewal - % Increase Cost Savings
 Renewal - \$ Increase Cost Savings
 Renewal - W/O Increase
 SFS Renewal - Prices In Original Contract
 SFS Renewal - Prices Not in Original Contract

Performance Security Deposit: \$ _____

Surety Bond: \$ _____

Annual Wage Order Number: _____

Annual Wage Order Date: _____

County(ies): _____

EXTENSION PERIOD:

Extension - 30-Day
 Termination
 Extension - \$ Increase Cost Savings
 Extension - W/O Increase
 Assignment
 Cancellation/Termination
 Other Amendment

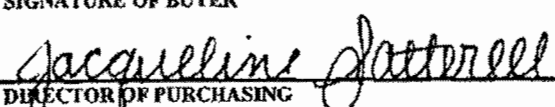
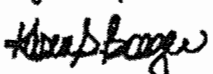
Other Instructions: _____

A. Section 34.040.6, RSMo	Buyer/Section Support	<u>JS</u>	<u>6-21-18</u>
B. Purchasing Suspension List	Buyer/Section Support	<u>OT</u>	<u>6-21-18</u>
C. Federal Suspension - SAM.GOV	Buyer/Section Support	<u>OT</u>	<u>6-21-18</u>
D. Labor Stds - OA/FMDC Contractor Debarment Lists	Buyer/Section Support		
E. Review of Participation Commitment Attainment - If app, Verify Receipt of 1 st Renewal - Blind/Shel Wkshp Affdvt	<u>Buyer</u>	<u>JS</u>	<u>6/22</u>
F. SFS Review/Justification - Insert Advertising Date, if applicable	Buyer		
	Buyer/Section Support	<u>JS</u>	<u>6-21-18</u>
	Buyer		
	Buyer/Section Support	<u>X</u>	<u>6-21-18</u>
Contractor E-Mail Address/Fax Number	<u>timdasurde@ex.com</u>		
State Agency Contact E-Mail Address			
Section 34.040.6, RSMo, Letter	Follow-Up Notes:		
A. Renewal/Extension Pricing	Buyer/Section Support		
B. Section 34.040.6, RSMo	Buyer/Section Support		
C. Performance Security Deposit/Surety Bond	Buyer/Section Support		
D. Renewal/Extension with Cost Savings Language	Buyer		
E. <u>Statewide Notice CS 170285-1</u>	Buyer	<u>JS</u>	<u>6-21-18</u>
F. SFS Authorized Limit \$	Buyer		
G.			
1. E-Verify Exhibit/Affidavit/Documentation	Buyer/Section Support		
2. Assignment and Consent Form	Buyer/Section Support		
3. Purchasing Suspension List	Buyer/Section Support		
4. Federal Suspension - SAM.GOV	Buyer/Section Support		
5. Labor Stds - OA/FMDC Contractor Debarment Lists	Buyer/Section Support		
	Buyer/Section Support		
	Buyer	<u>JS</u>	<u>6/22</u>
	Buyer/Section Support	<u>OT</u>	<u>6/20/18</u>
AM 300 PMM <u>00019404 m1</u>	Buyer/Section Support	<u>OT</u>	<u>6/20/18</u>
Distribute E-Verify & SDV Documents	Buyer/Section Support		
E-Mail/Fax NOA to Contractor/Assignee & Agency Contact	Buyer/Section Support	<u>OT</u>	<u>6/20/18</u>
Copy/Save As Statewide Notice to Internet Folder	<u>Buyer/Section Support</u>	<u>later OT</u>	
	Central Support-Participation	<u>KW</u>	<u>7-9-18</u>
	Central Support-Imaging	<u>JS</u>	<u>7-16</u>



NOTICE OF AWARD

State Of Missouri
Office Of Administration
Division Of Purchasing
PO Box 809
Jefferson City, MO 65102-0809
<http://oa.mo.gov/purchasing>

SOLICITATION NUMBER RFPS30034901700285	CONTRACT TITLE Photogrammetric Mapping Products and Services
CONTRACT NUMBER CS170285002	CONTRACT PERIOD September 15, 2017 through September 14, 2018
REQUISITION/REQUEST NUMBER NR 300 31957000001	SAM II VENDOR NUMBER/MissouriBUYS SYSTEM ID 4306906410 1/MB00048428
CONTRACTOR NAME AND ADDRESS SURDEX CORPORATION 520 SPIRIT OF ST LOUIS BLVD CHESTERFIELD, MO 63005	STATE AGENCY'S NAME AND ADDRESS State of Missouri Various Agency Locations
ACCEPTED BY THE STATE OF MISSOURI AS FOLLOWS:	
The proposal submitted by Surdex Corporation in response to RFPS30034901700285 is accepted in its entirety, including BAFO #001.	
BUYER Jacqueline Satterlee	BUYER CONTACT INFORMATION Email: jacqueline.satterlee@oa.mo.gov Phone: (573) 751-4925 Fax: (573) 526-9816
SIGNATURE OF BUYER 	DATE 9/7/17
DIRECTOR OF PURCHASING  Karen S. Boeger	

STATE OF MISSOURI
OFFICE OF ADMINISTRATION
DIVISION OF PURCHASING (PURCHASING)
REQUEST FOR BEST AND FINAL OFFER (BAFO)
FOR REQUEST FOR PROPOSAL (RFP)

BAFO REQUEST NO.: 001
SOLICITATION/OPPORTUNITY (OPP) NO.: RFPS30034901700285
TITLE: Photogrammetric Mapping Products and Services
ISSUE DATE: 05/24/17

REQ NO.: NR 300 31957000001
BUYER: Jacqueline Satterlee
PHONE NO.: (573) 751-4925
E-MAIL: jacqueline.satterlee@oa.mo.gov

BAFO RESPONSE SHOULD BE RETURNED BY: 05/31/17 AT 5:00 PM CENTRAL TIME

MAILING INSTRUCTIONS: Print or type RFP Number and Return Due Date on the lower left hand corner of the envelope or package. Sealed BAFOs should be in Division of Purchasing office (301 W High Street, Room 630) by the return date and time.

RETURN BAFO RESPONSE TO:

(U.S. Mail)	(Courier Service)
PURCHASING or	PURCHASING
PO BOX 809	301 WEST HIGH STREET, RM 630
JEFFERSON CITY MO 65102-0809	JEFFERSON CITY MO 65101-1517


CONTRACT PERIOD: Effective Date of Contract through One (1) Year

DELIVER SUPPLIES/SERVICES FOB (Free On Board) DESTINATION TO THE FOLLOWING ADDRESS:

State of Missouri
Various Agency Locations

The vendor hereby declares understanding, agreement and certification of compliance to provide the items and/or services, at the prices quoted, in accordance with all terms and conditions, requirements, and specifications of the original RFP as modified by any previously issued RFP addendums and by this and any previously issued BAFO requests. The vendor agrees that the language of the original RFP as modified by any previously issued RFP addendums and by this and any previously issued BAFO requests shall govern in the event of a conflict with his/her proposal. The vendor further agrees that upon receipt of an authorized purchase order from the Division of Purchasing or when a Notice of Award is signed and issued by an authorized official of the State of Missouri, a binding contract shall exist between the vendor and the State of Missouri.

SIGNATURE REQUIRED

VENDOR NAME	MissouriBUYS SYSTEM ID (SEE VENDOR PROFILE - MAIN INFORMATION SCREEN)
Surdex Corporation	48428
MAILING ADDRESS	
520 Spirit of St. Louis Blvd.	
CITY, STATE, ZIP CODE	
Chesterfield, MO 63005	
CONTACT PERSON	EMAIL ADDRESS
Tim Donze	timd@surdex.com
PHONE NUMBER	FAX NUMBER
636-368-4400	636-368-4401
VENDOR TAX FILING TYPE WITH IRS (CHECK ONE)	
<input checked="" type="checkbox"/> Corporation <input type="checkbox"/> Individual <input type="checkbox"/> State/Local Government <input type="checkbox"/> Partnership <input type="checkbox"/> Sole Proprietor <input type="checkbox"/> IRS Tax-Exempt	
AUTHORIZED SIGNATURE	DATE
	5/30/2017
PRINTED NAME	TITLE
Ronald C. Hoffmann	President



May 30, 2017

Attention: Jacqueline Satterlee
Division of Purchasing
301 West High Street, Truman Building, Room 630
Jefferson City, MO 65101-1517

RE: RFP NUMBER: RFPS30034901700285 BAFO REQUEST NO.: 001
RETURN DUE DATE: 05/31/17 AT 5:00 PM CENTRAL TIME
TITLE: Photogrammetric Mapping Products and Services

Dear Ms. Satterlee:

Surdex is pleased to be providing the State of Missouri our BAFO response by filling in the new table in Exhibit D to identify the location of aircraft that our team might use as part of your geospatial contract. The information in Exhibit D identifies our fixed wing aircraft here at Surdex as well as our subcontractors that can provide support with fixed wing and/or helicopter platforms.

As you will see, the Surdex planes operate from our headquarters and maintenance hangar in Chesterfield, Missouri. Surdex has proudly operated in Missouri for its entire existence, sixty plus years.

We have not found cause to change any other portion of our response to the State and hope the review panel has found our response complete and acceptable.

Sincerely,

A handwritten signature in black ink that reads "Tim Donze".

Tim Donze
Vice President, Business Development
Direct: (314) 422-7616 | Office: (636) 368-4400
TimD@surdex.com

A handwritten signature in black ink that reads "R. C. Hoffmann".

Ronald C. Hoffmann
President, Authorized Agent
Office: (636) 368-4400

BEST AND FINAL OFFER (BAFO) #001 to RFPS30034901700285**TITLE:** Photogrammetric Mapping Products and Services**CONTRACT PERIOD:** Effective Date of Contract through One (1) Year

The following exhibit in RFPS30034901700285 contains changes:

Exhibit D

DESCRIPTION OF AIRCRAFT, OWNED OR LEASED, BASED (ADDED PER BAFO #001)**EXHIBIT D.6 ADDED PER BAFO #001**

6. The vendor should provide the information included in the table below, if necessary the vendor may add additional pages:

Description of Aircraft	Is the Aircraft Owned, Leased, or Subcontracted? If Leased or Subcontracted, Who is Providing the Equipment?	Where is the Aircraft Based?
Cessna 441 Conquest II-10, Fixed wing Tail # N441EH	Owned / Surdex Corporation	Spirit of St. Louis Airport, Chesterfield, Missouri
Cessna 441 Conquest II-10, Fixed wing Tail # N440EH	Owned / Surdex Corporation	Spirit of St. Louis Airport, Chesterfield, Missouri
Cessna 441 Conquest II-10, Fixed wing Tail # N441FS	Owned / Surdex Corporation	Spirit of St. Louis Airport, Chesterfield, Missouri
Cessna 441 Conquest II-10, Fixed wing Tail # N2N9	Owned / Surdex Corporation	Spirit of St. Louis Airport, Chesterfield, Missouri
Cessna 414A Chancellor III, Fixed wing Tail # N414EH	Owned / Surdex Corporation	Spirit of St. Louis Airport, Chesterfield, Missouri
Cessna 335 II, Fixed wing Tail # N27EH	Owned / Surdex Corporation	Spirit of St. Louis Airport, Chesterfield, Missouri
Cessna TU-206F Turbo, Fixed wing Tail # N223SC	Owned / Surdex Corporation	Spirit of St. Louis Airport, Chesterfield, Missouri
Cessna TU-206F Turbo, Fixed wing Tail # N7268P	Owned / Surdex Corporation	Spirit of St. Louis Airport, Chesterfield, Missouri
Cessna TU-206F Turbo, Fixed wing Tail # N7258Z	Owned / Surdex Corporation	Spirit of St. Louis Airport, Chesterfield, Missouri
Cessna TU-206F Turbo, Fixed wing Tail # N72695	Owned / Surdex Corporation	Spirit of St. Louis Airport, Chesterfield, Missouri
Bell 206 Long Range Helicopter	Lease (when needed) / Helicopter Inc.	Cahokia, Illinois, requested with in the area of contracted work
King Air 200, Fixed wing (Geiger-mode LIDAR acquisition)	Leased / Dynamic Aviation Group (DAG), controlled by Harris Corporation	Bridgewater Virginia, Deployed throughout the US as required
King Air 200, Fixed wing (Geiger-mode LIDAR acquisition)	Leased / Dynamic Aviation Group (DAG), controlled by Harris Corporation	Bridgewater Virginia, Deployed throughout the US as required
King Air 200, Fixed wing (Geiger-mode LIDAR acquisition)	Leased / Dynamic Aviation Group (DAG), controlled by Harris Corporation	Bridgewater Virginia, Deployed throughout the US as required

Eric R. Geltens
Governor



Sarah H. Steelman
Commissioner

State of Missouri
OFFICE OF ADMINISTRATION
Division of Purchasing
301 West High Street, Room 630
Post Office Box 809
Jefferson City, Missouri 65102-0809
(573) 751-2387 Fax: (573) 526-9816
TTD: (800) 735-2966 Voice: (800) 735-2466
<http://oa.mo.gov/purchasing>

Karen S. Boeger
Director

May 24, 2017

Surdex Corporation
520 Spirit of St. Louis Blvd.
Chesterfield, MO 63005
timd@surdex.com

Dear Mr. Donze:

In accordance with paragraph 3.2 of RFP530034901700285 for Photogrammetric Mapping Products and Services, this letter shall constitute an official request by the State of Missouri to enter into competitive negotiations with your company.

Included with this letter is a complete copy of the RFP, including revisions to the RFP as a result of this request for negotiations. The cover page of the attached RFP is the Best and Final Offer #001 form. This BAFO #001 form must be completed, signed by an authorized representative of your organization, and returned with your BAFO response. Signing the BAFO #001 form cover page confirms your understanding and agreement to comply with the provisions and requirements of the RFP as modified by this request for a BAFO.

In your response to this Best and Final Offer, you may make any modification, addition, or deletion deemed necessary to your proposal. However, please be advised that it is not necessary for you to resubmit your entire proposal. Only the signed BAFO #001 form and any portions of your proposal that are being revised as a result of this request for a Best and Final Offer need be submitted. Your BAFO response is your final opportunity to ensure that (1) all mandatory requirements of the RFP have been met, (2) all RFP requirements are adequately described since all areas of the proposal are subject to evaluation, and (3) this is your best offer, including a reduction or other change to pricing.

You are requested to respond to this request for a BAFO by submitting a written, sealed "Best and Final Offer" BY 5:00 p.m. Central Time on Wednesday, May 31, 2017 to:

Attention: Jacqueline Satterlee
Division of Purchasing
301 West High Street, Truman Building, Room 630
Jefferson City, MO 65101-1517

Surdex Corporation

May 24, 2017

Page 2

The outside of the packet containing the BAFO response needs to state, "BAFO for RFP530034901700285" on the lower left corner. Please include the original plus five (5) copies (for a total of six (6) documents) of your response. In addition, the vendor should provide one (1) copy of the response in a Microsoft compatible format on a CD(s) or flash drive. Faxed or e-mailed responses are not acceptable.

You are reminded that pursuant to section 610.021, RSMo, proposal documents including any best and final offer documents are considered closed records and shall not be divulged in any manner until after a contract is executed or all proposals are rejected. Furthermore, you and your agents (including subcontractors, employees, consultants, or anyone else acting on their behalf) must direct all questions or comments regarding the RFP, the evaluation, etc. to me, as the buyer of record. Neither you nor your agents may contact any other state employee regarding any of these matters during the negotiation and evaluation process. Inappropriate contacts or release of information about your proposal or BAFO are grounds for suspension and/or exclusion from specific procurements.

If you have any questions regarding this BAFO request, please contact me at (573) 751-4925 or e-mail me at jacqueline.satterlee@oa.mo.gov. Your efforts in working with the State of Missouri to ensure a thorough evaluation of your proposal are sincerely appreciated.

Sincerely,

Jacqueline Satterlee

c: Evaluation Team
RFP530034901700285

Attachment: RFP including BAFO #001 form



STATE OF MISSOURI
OFFICE OF ADMINISTRATION
DIVISION OF PURCHASING (PURCHASING)
REQUEST FOR PROPOSAL (RFP)

SOLICITATION/OPPORTUNITY (OPP) NO.: RFPS30034901700285
TITLE: Photogrammetric Mapping Products and Services
ISSUE DATE: 02/22/17

REQ NO.: NR 300 31957000001
BUYER: Jacqueline Satterlee
PHONE NO.: (573) 751-4925
E-MAIL: jacqueline.satterlee@oa.mo.gov

RETURN PROPOSAL NO LATER THAN: 03/15/17 AT 2:00 PM CENTRAL TIME (END DATE)

VENDORS ARE ENCOURAGED TO RESPOND ELECTRONICALLY THROUGH [HTTPS://MISSOURIBUYS.MO.GOV](https://missouribuy.mo.gov) BUT MAY RESPOND BY HARD COPY (See Mailing Instructions Below)

MAILING INSTRUCTIONS: Print or type Solicitation/OPP Number and End Date on the lower left hand corner of the envelope or package. Delivered sealed proposals must be in the Purchasing office 301 W High Street, Room 630) by the return date and time.

	(U.S. Mail)	or	(Courier Service)
RETURN PROPOSAL TO:	PURCHASING		PURCHASING
	PO BOX 809		301 WEST HIGH STREET, RM 630
	JEFFERSON CITY MO 65102-0809		JEFFERSON CITY MO 65101-1517

CONTRACT PERIOD: Effective Date of Contract through One (1) Year

DELIVER SUPPLIES/SERVICES FOB (Free On Board) DESTINATION TO THE FOLLOWING ADDRESS:

State of Missouri
Various Agency Locations

The vendor hereby declares understanding, agreement and certification of compliance to provide the items and/or services, at the prices quoted, in accordance with all requirements and specifications contained herein and the Terms and Conditions Request for Proposal (Revised 10/19/15). The vendor further agrees that the language of this RFP shall govern in the event of a conflict with his/her proposal. The vendor further agrees that upon receipt of an authorized purchase order from the Division of Purchasing or when a Notice of Award is signed and issued by an authorized official of the State of Missouri, a binding contract shall exist between the vendor and the State of Missouri. The vendor shall understand and agree that in order for their proposal to be considered for evaluation, they must be registered in MissouriBUYS. If not registered at time of proposal opening, the vendor must register in MissouriBUYS upon request by the state immediately after proposal opening.

SIGNATURE REQUIRED

VENDOR NAME	MissouriBUYS SYSTEM ID (SEE VENDOR PROFILE - MAIN INFORMATION SCREEN)
Surdex Corporation	48428
MAILING ADDRESS	
520 Spirit of St. Louis Blvd.	
CITY, STATE, ZIP CODE	
Chesterfield, MO 63005	
CONTACT PERSON	EMAIL ADDRESS
Tim Donze	TimD@surdex.com
PHONE NUMBER	FAX NUMBER
636-368-4400	636-368-4401
VENDOR TAX FILING TYPE WITH IRS (CHECK ONE)	
<input checked="" type="checkbox"/> Corporation <input type="checkbox"/> Individual <input type="checkbox"/> State/Local Government <input type="checkbox"/> Partnership <input type="checkbox"/> Sole Proprietor <input type="checkbox"/> IRS Tax-Exempt	
AUTHORIZED SIGNATURE	DATE
	03/15/2017
PRINTED NAME	TITLE
Ronald C. Hoffmann	President



Table of Contents

TRANSMITTAL LETTER/ EXECUTIVE SUMMARY.....	4
EXHIBIT A: VENDOR INFORMATION.....	6
A. COMPANY HISTORY.....	6
B. TYPE OF SERVICES.....	7
C. PREVIOUS EXPERIENCE.....	7
D. PREVIOUS EXPERIENCE WORKING WITH FEDERAL AGENCIES, STATE, COUNTY AND CITY GOVERNMENTS	7
E. YEARS OF EXPERIENCE WITH GOVERNMENT ENTITIES.....	9
F. EXPERIENCE DEVELOPING MULTI-RESOLUTIONS ORTHOIMAGERY MAPPING PRODUCTS	9
G. EXPERIENCE DEVELOPING MULTI-RESOLUTION ORTHOIMAGERY USING AIRBORNE GPS.....	9
H. SAMPLES.....	10
<i>Viewing and Downloading Samples Data</i>	<i>10</i>
EXHIBIT B: CURRENT/PRIOR EXPERIENCE.....	11
EXHIBIT C: EXPERTISE OF KEY PERSONNEL	19
EXHIBIT D: METHOD OF PERFORMANCE	41
1. PRODUCTS/SERVICES PROVIDED.....	41
2. PROJECT APPROACH.....	43
2.1 <i>Categories of Products/Services.....</i>	<i>43</i>
a) Acquisition of Digital Orthoimagery	43
b) Acquisition of LIDAR Elevation Data	56
c) Creation of Digital Terrain Model from LIDAR.....	59
d) Creation of Digital Elevation Model from LIDAR.....	61
e) Creation of Contours Lines	61
f) Planimetric Mapping	63
g) Mobile LIDAR	65
h) Helicopter LIDAR.....	66
i) Geiger LIDAR.....	67
j) Web Hosting.....	70
k) Oblique Imagery Capture and Processing.....	72
l) Photogrammetric Point Clouds	74
2.2 <i>Expedite Completion of Project.....</i>	<i>75</i>
2.3 <i>State Agency Involvement Plan.....</i>	<i>75</i>
2.4 <i>Quality Assurance Plan and Quality Control process(es)</i>	<i>77</i>
3. EQUIPMENT AND SOFTWARE PROPOSED	87
a) Digital Sensor Camera	87
b) LIDAR Sensors	92
c) Aircraft.....	94
d) Software	95
4. EQUIPMENT AND PERSONNEL AVAILABILITY	98
4.1 <i>Deployment of Surveying Personnel</i>	<i>98</i>
4.2 <i>Deployment of Aerial Photography Equipment and Personnel.....</i>	<i>98</i>
4.3 <i>Ability to Maintain Available Personnel and Equipment for Individual Projects.....</i>	<i>100</i>
5. ECONOMIC IMPACT TO MISSOURI.....	100
5.1 <i>Missouri Products and Performance by Missourians</i>	<i>100</i>
5.2 <i>Economic Impact to the State of Missouri through Tax Revenue Obligations</i>	<i>100</i>
5.3 <i>Company's Economic Presence in State of Missouri</i>	<i>101</i>
EXHIBIT E: PARTICIPATION COMMITMENT	102
EXHIBIT F: DOCUMENTATION OF INTENT TO PARTICIPATE	104
EXHIBIT G: BUSINESS ENTITY CERTIFICATION (E-VERIFY).....	106
BUSINESS ENTITY CERTIFICATION AND ENROLLMENT:.....	106



E-VERIFY MEMORANDUM OF UNDERSTANDING (MOU)107

EXHIBIT H: CERTIFICATION..... 109

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION LOWER TIER COVERED TRANSACTIONS..... 109

EXHIBIT I: MISCELLANEOUS INFORMATION 110

Outside United States: 110

Employee/Conflict of Interest:..... 110

Registration of Business Name..... 111

Proposed Subcontractors 111



Transmittal Letter/ Executive Summary

THE SURDEX TEAM

Surdex is pleased to submit this fully compliant response to RFP RFP530034901700285, "Photogrammetric Mapping Products and Services" issued by the Missouri Office of Administration, Division of Purchasing and Materials Management. Surdex has assembled a team addressing all stated requirements as well as additional capabilities that may be of use in future projects. Our Team presents a capacity that can address the largest envisioned projects in the coming years. Our teammates include a Woman and Minority Business Enterprises (WBE, MBE). By far the majority of work will be performed by Missouri-based businesses, keeping tax revenue and employment within the State of Missouri to the maximum extent.

Our Team brings an array of aerial Imagery and LIDAR systems to this effort. This represents a truly all-digital solution for orthophotos, terrain models, contours, planimetric mapping, and the like.

Team Member	Role	Primary Location	Responsibilities
Surdex Corporation	Prime Contractor	Chesterfield, MO	Project design, project management, aerial imagery and LIDAR acquisition, image processing, aerotriangulation, digital orthophotos, DEM/DTM processing, contours, planimetric processing
David Mason & Associates	Subcontractor (MBE)	St. Louis, MO	Field survey
EFK Moen	Subcontractor (WBE)	St. Louis, MO	Field survey
Merrick & Company	Subcontractor	Denver, CO	Fixed-wing and helicopter LIDAR acquisition and processing, mobile LIDAR acquisition and processing
Harris Corporation	Subcontractor	Melbourne, FL, with major Missouri office	Gelger LIDAR acquisition and processing
ESP	Subcontractor	Fort Mill, SC	Mobile LIDAR acquisition and processing

WBE/MBE COMMITMENT

Surdex fully recognizes the need and benefit of the participation of Woman and Minority Business Enterprises and our Team incorporates 2 such businesses to meet the specifications for the State of Missouri. We are proposing levels of participation that we incorporated into our previous Missouri Statewide Project Surdex was responsible for. For this past projects for the State, the WBE/MBE subcontracts amounted to 15.4% of the total contract value.

TECHNOLOGY

Our Team is offering technology that meets and exceeds the RFP specifications. We bring a large number airborne sensors to this effort, hosted in high-performance aircraft. Additionally, we are offering technology that exceeds the stated services so as to better serve potential clients through this contractual relationship.

- Surdex owns and operates five (5) Leica ADS100 pushbroom, multispectral cameras, making our company the largest such installation in the United States and one of the largest in the world.
- Surdex also owns and operates three (3) Leica DMC-1 frame format, multispectral cameras.
- Surdex owns and operates a Leica RCD30 Oblique camera system. With additional components purchased by Surdex, this can be operated as a 5-camera ("penta") configuration suitable for urban mapping, up to two 3-camera ("trio") configurations addressing corridor applications, or a single camera mounted with our Galaxy LIDAR, or operated in a single-camera mode.



The ADS100 technology reduces the acquisition effort with its large swath and ability to fly higher for a given ground resolution. The Oblique system based on the RCD30 medium-format digital camera may also be suitable for smaller orthoimagery projects with 4-band imagery and the added bonus of forward, aft, left, and right oblique views. With our ADS100 and DMC-1 systems, we can provide frame and/or pushbroom technology for each project to meet specific requirements. In most cases, only one type of sensor will be used on a specific project.

In addition to existing and new technology directly addressing the stated RFP requirements, our Team is also offering additional technology that we feel may be applicable to future projects, this includes:

- Surdex's OpTech Galaxy LIDAR acquisition and processing.
- Helicopter-borne LIDAR acquisition and processing.
- Web hosting of geospatial data.
- Mobile LIDAR mapping.
- State-of-the-art Geiger LIDAR acquisition and processing.

PAST EXPERIENCE

In addition to being responsible for the statewide contracts from 2007-2009 and a contract holder for the 2013-2016 state programs, Surdex has been responsible for numerous other projects in and around the State of Missouri. The projects include local, state, and federal government agencies.

If one analyzed the orthoimagery, LIDAR and mapping projects performed in the State of Missouri in the recent past, it is clear that Surdex has uniquely performed to the expectations of our clients. Given Surdex's proven track record, we give our clients the peace of mind that their project will be handled with the greatest of capability, expertise, and care. We fully realize that we are "only as good as our last project".

CAPACITY

To put our digital orthoimagery capacity into perspective, with our advanced imaging technology and the large number of systems at our Team's disposal, we are capable of acquiring and processing the entire 70,000 square miles of the State of Missouri at 1' or 2' resolution every year. From the LIDAR perspective, we estimate that we are able to acquire and process data at 1-meter post spacing for over a third of the State each year.

CONCLUSION

Surdex strongly believes our Team represents the most highly qualified solution that will be offered to the State. Our Team's strengths are:

- The technology and capacity our Team brings provides a cost-effective solution for projects of all sizes.
- Our Team will retain employment and tax revenue within the State to the maximum extent.
- The local presence of our key aerial sensors and fleet of aircraft ensures aerial data capture during adverse weather and climate and minimizes the cost of ferrying systems to and from projects.
- We are embracing the use of MBE and WBE participation in the projects to support the small business program initiatives of the State.



EXHIBIT A: Vendor Information

A. COMPANY HISTORY

Provide a brief company history, including the founding date and number of years in business as currently constituted.

Surdex Corporation is a privately-owned company that has been in continuous operation for over 60 years and is currently one of the 10 largest aerial mapping companies in the United States. We have been based in the greater St. Louis, Missouri, metropolitan area since 1954. Over the last decade we have grown from a regional company to a nationwide presence, including projects in Canada and Mexico. Approximately 90 employees work at our headquarters building and hangar complex at the Spirit of St. Louis Airport in Chesterfield, Missouri. Our clientele include federal, state, and local government as well as private engineering, defense mapping, and Homeland Security.

Our other Team members / subcontractors:

- **David Mason & Associates (DMA)** (MBE, field survey): Founded in 1989, DMA provides civil and structural engineering, architectural document support, land surveying, and construction management/program management services to meet the needs of a diverse base of clients. DMA crews are experienced with property/boundary surveys, aerial mapping and topographic surveys, roadway and right of way surveys, hydraulic and bridge surveys and GPS survey projects.
- **EFK Moen (WBE, field survey)**: In February 1998, EFK Moen, LLC was organized under the laws of the State of Missouri to offer civil engineering design consulting. The engineering services we provide are based on integrity and professionalism; and we are dedicated to providing quality service to our clients and substantial career opportunities to our staff. EFK Moen began providing transportation engineering design services as a prime consultant to the Missouri Department of Transportation, the St. Louis Metropolitan Sewer District and numerous Counties and Municipalities and private clients throughout the State of Missouri and now our services have expanded throughout the Midwest. In 1999 EFK Moen began providing Professional Land Surveying services, now under the direction of Chris Ferrante, PLS. A structural engineering group was created in 2000, now managed by Chris Linneman, PE/SE.
- **Harris Corporation** (Geiger LIDAR acquisition and processing): Harris Corporation was created in the late 1890's. The company has approximately \$8 billion in annual revenue and over 23,000 employees, including 9,000 engineers and scientists supporting customers in more than 125 countries. For 25 years, Harris has created geospatial information solutions that meet the exacting—and often unique—needs of government and commercial customers. Today, through our IntelliEarth™ Geospatial Solutions, we are making it easier and more cost effective to visualize the physical environment for a wide range of applications. Harris' IntelliEarth™ Geiger-mode LIDAR sensor and tool suite supports cost effective, large area topographic mapping can for multiple geospatial applications, and for generating integrated enterprise geospatial information and situational knowledge products to benefit our customers and stakeholders.
- **ESP Associates, P.A.** (mobile LIDAR acquisition and processing): Founded in 1986, ESP Associates, is a multi-disciplinary, consulting, civil engineering, planning, and geomatics firm. 3D Mobile Mapping is the newest technology used to collect mass quantities of terrestrial LIDAR at both mapping grade and survey grade accuracies. The concept of mounting two 3D lasers, 4 to 6 cameras, a military grade IMU and two GPS receivers to a vehicle and collecting continuous point data clouds at highway speeds provides the most efficient and accurate method of data collection along highways, secondary roads, beaches and other routes permitting vehicle access.



B. TYPE OF SERVICES

Describe the nature of the vendor's business, type of services performed, etc. Identify the vendor's website address, if any.

Surdex's website is: www.surdex.com. We perform the following core services:

Surdex Services and Application Performed	
Services	Applications
<ul style="list-style-type: none"> ■ Aerial digital orthoimagery acquisition and processing ■ Planimetric and topographic mapping ■ LIDAR acquisition and processing ■ Oblique imagery ■ Control survey ■ Unmanned Aerial Systems (UAS) acquisition 	<ul style="list-style-type: none"> ■ Impervious surface mapping ■ Topographic mapping ■ GIS base and parcel mapping ■ Corridor mapping: utilities, pipeline, transportation ■ Vegetation analysis ■ Land cover/land use ■ Urban planning ■ Forestry ■ Floodplain mapping ■ Agriculture/crop science ■ Environmental assessment ■ Engineering design ■ First responders, EMS, fire and ambulance, schools

C. PREVIOUS EXPERIENCE

Describe any previous project experiences of a similar nature and complexity in scope, responsibility and technologies involved.

Surdex was responsible for the Missouri Statewide 2' resolution projects began in 2007 and finished in 2009 and numerous orthoimagery task orders during the 2013-2016 state contract. Most notably, in 2014-2015, Surdex was responsible for the Texas Statewide Orthoimagery program in which 275,000 square miles of 0.5-meter and 13,000 square miles of mixed 1' and 6" resolution were captured and processed. In addition, we have been involved in numerous IDIQ (Indefinite Delivery/Indefinite Quantity) contractual arrangements, which are similar to those intended by this RFP. Most notably, these include:

- The USDA National Agriculture Imagery Program (NAIP) from 2003 to present. This included three successive IDIQ arrangements varying in length of from 3 to five years. Anywhere from 3-10 contractors were chosen for each IDIQ cycle, competing for annual task orders.
- Surdex is in its second successive IDIQ with the US Corps of Engineers, St. Louis District. Various task orders have been issued against this contract, including technologies such as required and proposed on this RFP.
- Along with our Teammate, Merrick & Company, we hold a Joint Venture contract with the US Geological Survey for the General Photogrammetric Services Contract (GPSC).

For contractual arrangements such as these, Surdex operates as a "broker" of the client. If selected by the State, Surdex will actively investigate possible projects and cost-sharing opportunities that could be brought to this contract as a benefit to the State.

D. PREVIOUS EXPERIENCE WORKING WITH FEDERAL AGENCIES, STATE, COUNTY AND CITY GOVERNMENTS

Provide information regarding previous experience working with federal agencies, state, county, and city governments.

Approximately 90% of our work is for public sector / governmental agencies – federal, state, county, and municipal governments. Many of our projects are for multiple public entities (for example, a consortium of several counties,



a county in conjunction with several cities, etc.). Having been a major provider to government entities for over 60 years, Surdex is extremely experienced working with governments and has a clear understanding of their needs.

We undertake projects across the United States and beyond (including Canada, Mexico, and Puerto Rico). Many projects include imagery at multiple resolutions (such as 12", 6", 3" GSD) along with other deliverables (such as LIDAR data, DEM/DTM, topographic mapping, planimetric mapping, and oblique imagery). Surdex performs all services including image and LIDAR acquisition, control survey, aerial triangulation, image and LIDAR processing, and quality assurance/quality control measures at every step of production. The following table describes several of our recent projects (many in Missouri) with a wide range of services and products:

Recent Projects by Type		
Type	Client	Description
Federal	USDA National Agriculture Imagery Program (NAIP)	15 consecutive years of imagery at from 2m to 1m GSD covering 32 states. Over 6 million square miles.
	USACE, Meramec Basin LIDAR	LIDAR elevation data (15 cm accuracy on bare ground, and 40 cm in vegetation and hillsides, overall 18 cm), and totaled 5,692 square miles of Eastern Missouri meeting the NDEP Guidelines.
	USACE / MO NRCS / USGS, LIDAR of the Metropolitan St. Louis Sewer District	High-resolution digital elevation data from LIDAR acquisition. The total project included two priority zones of 13 counties and totaled 6,282 square miles.
State	State of Missouri, statewide digital orthoimagery (2007, 2008/9, 2016)	Digital imagery and the production of true color DOQQs at 2' (State Plane) and 0.6 meter (UTM) resolution. In 2007, Surdex was awarded a contract through its existing Department of Transportation agreement.
	State of North Carolina, Digital Orthoimagery Project	Five consecutive years (2012-2016) of 6" GSD imagery of approximately 17,000 square miles.
	Iowa Statewide Digital Orthoimagery Project	Statewide digital orthoimagery at 12"/30cm during the Spring of 2016.
	State of Texas, Statewide Digital Orthoimagery	0.5 meter 4-band digital orthophotography over the entire state of Texas (275,000 square miles). Acquisition was late 2014 through spring of 2015, during leaf-off conditions. Several metropolitan areas elected higher resolution 12" and 6" GSD imagery.
County	Boone County Consortium, Missouri	Multiple resolutions of digital orthophotos covering the counties of Boone, Cole, Howard, Callaway, Cooper, Moniteau and Johnson. 12", 6" and 3" GSD plus LIDAR and 2' contours.
	East-West Gateway Coordinating Council, Missouri	Two projects by the East-West Gateway and the St. Louis Area Regional Response System, in 2012 and 2015, for 6" GSD imagery totaling roughly 9,800 square miles.
	Houston-Galveston Area Council (H-GAC)	Digital orthoimagery in 2012, 2014, and 2016 of approximately 30,000 square miles of imagery from 6", 3" and 12" GSD.
	Mid-America Regional Council (MARC), Kansas	Multi-county project encompassing 2,526 square miles of Kansas City and the surrounding metro area of 6" GSD.
	Newton County, Missouri, Digital Orthophotography	County-wide 6" GSD color digital aerial imagery in the spring of 2016 totaling 627 square miles.
	Nodaway County, Missouri, Digital Orthoimagery	2012 and 2017 digital orthoimagery at 6" and 12" GSD, of 879 square miles each year.
Municipal	City of Columbia, Missouri	Part of the seven-county project orchestrated through the Boone County Consortium; 64 square miles of 6" GSD plus LIDAR.
	City of Roswell, Georgia	6" GSD orthoimagery of five Georgia communities in the Roswell, Georgia area totaling 132 square miles.



E. YEARS OF EXPERIENCE WITH GOVERNMENT ENTITIES

Indicate the number of years the vendor's business has been providing services of the nature of those described in the RFP for government entities.

Surdex has been in continuous operation since 1954, marking its 63rd year in 2017. Founded on aerial photography, the company is a premier geospatial data provider primarily focused on orthoimagery, survey, planimetric mapping, and elevation modeling (DEM, DTM, contours). Surdex began the conversion to digital sensors in 2004. LIDAR data capture and processing began in 2005. We began using an Unmanned Aerial System as a mode of capture in 2016, and in 2015-16 were conducting tests on our new Oblique system to incorporate it into our production process.

F. EXPERIENCE DEVELOPING MULTI-RESOLUTIONS ORTHOIMAGERY MAPPING PRODUCTS

Provide the vendor's experience developing multi-resolution orthoimagery mapping products.

Many projects involved multiple resolutions of data. Many large Councils of Governments (COGs) involve both rural and urban expanses and, for funding reasons, often involve lower-resolution data in the outlying areas and higher-resolution data in the urban areas. You will note in the table in Section D above, many of the projects include multiple resolutions and additional planimetric services (such as LIDAR, DEM/DTM update, and topographic/planimetric mapping). In general:

- Rural areas are typically at 1'-2' resolution. Many statewide efforts include 1'-1.5' resolution, leaving local governments to "buy-up" to 6" or better resolutions.
- Urban areas typically require 6" resolution.
- Downtown areas are frequently requiring "near true orthos" at 6" resolution (reduced building lean) and an increasing number are trending toward 3" resolution.

In the last couple of years, Surdex has been involved in two large projects that illustrate multiple resolutions, both involving federal, state, and local government funding.

- The 2014-2016 Texas Statewide Orthoimagery project entailed 275,000 square miles of 0.5-meter and 13,000 square miles of mixed 1'/6" resolution.
- The long-standing Houston-Galveston Area Council (H-GAC) project includes a large number of local government partners. Starting in 2012, Surdex has acquired and produced 3", 6", and 12" imagery coverage the entire metropolitan area multiple times.

G. EXPERIENCE DEVELOPING MULTI-RESOLUTION ORTHOIMAGERY USING AIRBORNE GPS

Provide the vendor's experience developing multi-resolution orthoimagery using airborne GPS.

Virtually all imagery and LIDAR missions are founded on the collection, processing, and incorporation of Airborne GPS (ABGPS) and IMU (Inertial Measurement Unit) processing in the production effort. Where accuracy requirements permit (ASPRS Standard Mapping and GIS/Class I or lesser accuracy in general terms), this information alone may be sufficient to avoid the placing and measuring of ground control points. Surdex's decades of experience has proven that aerotriangulation of the imagery is always required to minimize potential shear between adjacent images or strips of images. Control points will be used on every project to ensure accuracy standards are met or exceeded.



H. SAMPLES

Submit a sample(s) of digital orthoimagery and other photogrammetric products produced for a previous or current client that are representative of the product required herein. However, if the vendor is proposing another entity to provide the services, the vendor should submit samples of some of the proposed entity's previous digital orthoimagery and other photogrammetric products produced.

Surdex is providing samples of digital orthoimagery at various resolutions of projects within the State of Missouri. We are also providing planimetric data from a state project as well. We are also providing a sample of QL2 LIDAR data of the State of Nebraska acquired using our Galaxy LIDAR sensor. Additionally, we are providing Gelger LIDAR data acquired by our subcontractor, Harris. The following is a list of recent sample data representative of our work:

Sample Project Data		
Type	Sensor	Description
Digital Orthoimagery	Leica ADS100 sensor	12" GSD TIFF with TIFF world file (Boone County, MO 2016) 6" GSD TIFF with TIFF world file (Boone County, MO 2016) 3" GSD TIFF with TIFF world file (Boone County, MO 2016)
LIDAR	Galaxy LIDAR sensor	QL2, .LAS files, (State of Nebraska, 2016)
Gelger LIDAR	Harris Geiger-mode sensor	Classified data set 8 ppm (Charlotte, North Carolina) Classified data set 20 ppm (Charlotte, North Carolina)
Planimetric Mapping	ADS100 sensor	Planimetric data set (Columbia, MO 2016)
Topographic Mapping	ADS100 sensor	Topographic data set (Columbia, MO 2016)

Note: all samples are the work of Surdex Corporation with the exception of the Gelger LIDAR data, which was acquired and processed by our Teammate, Harris Corporation.

Viewing and Downloading Samples Data

Our samples has been set up for you to view on an FTP site.

Hyperlink: <ftp.surdex.net>

User login: Missouri

Password: MO2017

Copy and paste the above hyperlink into a browser URL window or a Windows Explorer address window.

After 3 failed attempts to login, contact us if you have difficulty accessing the data, feel free to email timd@surdex.com for assistance.



EXHIBIT B: Current/Prior Experience

Vendor Name or Subcontractor Name: <u>Surdex Corporation</u>		
Reference Information (Current/Prior Services Performed For:)		
References	1	2
Name of Reference Company:	State of Missouri	Mid-America Regional Council (MARC)
Address of Reference Company ✓ Street Address ✓ City, State, Zip	State of Missouri, Office of Administration Information Technology Services Division Office of Geospatial Information Truman Building, Room 840 Jefferson City, MO 65102	600 Broadway Suite 200 Kansas City, MO 64105
Reference Contact Person Information: ✓ Name ✓ Phone Number ✓ E-mail Address	Arnold Williams, GIS Manager (573) 526-1817 Arnold.williams@os.mo.gov	Jakob Goldman (816) 701-8307 jgoldman@marc.org
Dates of Services:	2016; 2008-2009, 2007	2016 and 2010
If service/contract has terminated, specify reason:	No	No
Dollar Value of Services	\$394,335 (2016) \$248,619 (2008) \$410,909 (2007)	\$193,328 (2016), \$313,309 (2010)
Description of Services Performed including the following:		
✓ Acquisition of Digital Orthoimagery	<p>Aerial acquisition of digital imagery and the production of true color DOQQs</p> <p>2007: GSD: 2" / .6M, square miles: 72,656, 2008: GSD: 2" / .6M, square miles: 75,036, 2016 18", square miles: 30,610.</p> <p>Adverse weather (Ice and quick warming) in the spring of 2008 precluded capture of all of the remaining 1/3rd (western portion) of the State. This was completed in the spring of 2009.</p> <ul style="list-style-type: none"> Digital Orthoimagery 30 degree Sun Angle, 5% per DOQQ for clouds/No Snow DOQQs were provided in both UTM and State Plane reference frames. Used subcontractors for Survey Data Collection: David Mason & Associates 	<p>In 2016 Surdex conducted a multi-county project encompassing 2,526 square miles of Kansas City and the surrounding metro area (consisting of Leavenworth and Wyandotte counties in Kansas; and Platte, Cass, Ray, Jackson and Clay counties in Missouri. To reduce building lean of tall buildings in Approximately 15 square miles of urban Kansas City, Surdex densified the flight lines. The client-provided DEM was also updated and provided as a deliverable.</p> <ul style="list-style-type: none"> 6" GSD 4-band digital orthoimagery of Kansas City metro area in GeoTIFF and MrSID format Updated DEM Metadata files by tile and county in FGDC .xml format Mosaic seamlines in ESRI format



Vendor Name or Subcontractor Name: <u>Surdex Corporation</u>		
Reference Information (Current/Prior Services Performed For:)		
References	3	4
Name of Reference Company:	Boone County Consortium (Boone, Cole, Howard, Callaway, Cooper, Moniteau and Johnson Counties, Missouri)	City of Columbia, Missouri
Address of Reference Company: ✓ Street Address ✓ City, State, Zip	GIS Dep't, City of Columbia, MO 801 East Walnut, Room 220 Columbia, MO 65201	GIS Dep't, City of Columbia, MO 801 East Walnut, Room 220 Columbia, MO 65201
Reference Contact Person Information: ✓ Name ✓ Phone Number ✓ E-mail Address	Jason Warznik (573) 886-4325 jwarznik@boonecountymo.org	Kenny Legleiter, GISP (573) 441-5489 kileg1e1@gocolumblamo.com
Dates of Services:	January 2015 – December 2015	January 2015 – July 2016
If service/contract has terminated, specify reason:	No	No
Dollar Value of Services	\$311,000 (Billed under the Boone County Consortium Project)	\$311,000 (Billed under the Boone County Consortium Project)
Description of Services Performed including the Following:		
<ul style="list-style-type: none"> ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	<p>Seven-county project orchestrated through the Boone County Consortium, Missouri, with the various counties / municipalities requesting different deliverables.</p> <ul style="list-style-type: none"> • 3" / 6" / 12" RGB and CIR digital orthoimagery in GeoTiff (Square miles: 3" 5 sq.mi. / 6" 1,373 sq.mi. / 12" 3,148 sq.mi.) • 691 square miles of 0.7M LIDAR • Bare-earth grids, ERDAS Imagine • 2' contours in ESRI Geodatabase • Hydro breaklines in SHP • 27.5 sq. mi. of 1"=200' scale 3D planimetric mapping in ESRI Geodatabase (for the City of Columbia) • FGDC metadata • Flown Spring 2015, delivered Fall 2015 	<p>The city's project was a part of the seven-county project orchestrated through the Boone County Consortium, Missouri, with the various counties / municipalities requesting different deliverables. The City project entailed not only digital orthoimagery, but also LIDAR acquisition, topographic mapping and planimetric mapping in select areas.</p> <ul style="list-style-type: none"> • GDS: 6", square miles: 264 of spring leaf-off 4-band digital orthoimagery with delivery in GeoTIFF and TWF files • Bare-earth LAS • LIDAR data at 0.7m spacing • 28 sq. mi. of 1"=200' scale 3D planimetric mapping in ESRI Geodatabase • Two-foot contours (citywide)



Vendor Name or Subcontractor Name: <u>Surdex Corporation</u>		
Reference Information (Current/Prior Services Performed For:)		
References	5	6
Name of Reference Company:	State of North Carolina	USDA, NRC Southwest Oklahoma
Address of Reference Company <input checked="" type="checkbox"/> Street Address <input checked="" type="checkbox"/> City, State, Zip	ESP & Associates 3475 Lakemont Blvd. Fort Mill, SC 29708	USDA, Natural Resource Conservation Service URS Corporation
Reference Contact Person Information: <input checked="" type="checkbox"/> Name <input checked="" type="checkbox"/> Phone Number <input checked="" type="checkbox"/> E-mail Address	Harold Rempel, Senior Geospatial Manager (803) 835-0851 Email: hrempel@espassociates.com	Jennifer Williams (303)740-3901 Jennifer.I.williams@urs.com Gary Utley, USDA-NRCS (405)742-1229 Gary.utley@ok.usda.gov
Dates of Services:	2014	2012
If service/contract has terminated, specify reason:	No	
Dollar Value of Services	\$888,288	\$3M (Merrick and Surdex)
Description of Services Performed including the Following:		
<input checked="" type="checkbox"/> Acquisition of LIDAR Elevation Data <input checked="" type="checkbox"/> Creation of Digital Terrain Model from LIDAR <input checked="" type="checkbox"/> Creation of Digital Elevation Model from LIDAR	<p>For this task order, Surdex was responsible for all Flight Operations Management, including the acquisition of digital elevation data for 20 Counties in the Eastern Piedmont using airborne LIDAR. Surdex served as the primary Point of Contact (POC) between all ESP Team Members, for the duration of LIDAR Data Acquisition. This task order included block layout designation, daily flight plan management and reporting, team coordination, issue mitigation, coordination with Military Operation Areas (MOAs), and daily progress reporting to ESP.</p> <ul style="list-style-type: none"> • Sensor: ALS70 • 4,100 square miles • 0.7 meter post processing • Density: 2 points/square meter • Vertical Accuracy: RMSE of 9.25 cm (3.64") or better 	<p>Merrick and Surdex were contracted by URS to perform airborne mapping services covering approximately 20,000 sq. miles of various watersheds in Oklahoma in support of the US Department of Agriculture's Natural Resources Conservation Service (USDA-NRCS). The purpose of this project was to generate digital elevation models and contours for use in hydraulic/hydrologic models. Contract Value:</p>



Vendor Name or Subcontractor Name: <u>David Mason & Associates</u>			
Reference Information (Current/Prior Services Performed For:)			
References	7	8	9
Name of Reference Company:	Wilson & Company	Surdex Corporation	Missouri Department of Transportation
Address of Reference Company ✓ Street Address ✓ City, State, Zip	800 East 101 st Terrace, #200 Kansas City, MO 64131	520 Spirit of St. Louis Boulevard Chesterfield, MO 63005	1590 Woodlake Drive Chesterfield, MO 63017
Reference Contact Person Information: ✓ Name ✓ Phone Number ✓ E-mail Address	Erica Stock 816.701.3109 Erica.stock@wilsonco.com	Russell D. Hoffman (636) 368-4400 russh@surdex.com	Shirley Norris, PE (314) 453-5032 Shirley.norris@modot.mo.gov
Dates of Services:	2/2016 – 5/2016	3/2016 – 5/2016	6/2013 – 7/2015
If service/contract has terminated, specify reason:	All work completed	All work completed	All work completed
Dollar Value of Services	\$108,200.00	\$13,500.00	\$284,412.00
Description of Services Performed Including the Following:			
✓ Acquisition of Digital Orthomography ✓ Acquisition of LIDAR Elevation Data	David Mason & Associates provided horizontal/vertical ground control for aerial survey of Missouri Department of Conservation site. Scope of services included setting aerial targets panels, acquiring coordinates/elevations via GPS surveying, and removing target panels.	✓ Acquisition of Digital Orthomography ✓ Acquisition of LIDAR Elevation Data	✓ Acquisition of LIDAR Elevation Data
✓ Acquisition of Digital Orthomography ✓ Acquisition of LIDAR Elevation Data		David Mason & Associates provided horizontal/vertical ground control for 2016 East Half of Missouri Orthophoto & Mapping Project. Scope of services included acquiring coordinates/elevations of ground control survey points via GPS surveying.	David Mason & Associates provided ground control for both aerial and mobile LIDAR. Surdex Corporation completed the aerial and mobile LIDAR on the project. The project was 10 miles of Highway B in Jefferson County from Highway 21 to Highway 30.



Vendor Name or Subcontractor Name: <u>EFK Moen</u>			
Reference Information (Current/Prior Services Performed For:)			
References	10	11	12
Name of Reference Company:	MoDOT St. Louis District	O'Fallon Missouri	Surdex Corporation
Address of Reference Company ✓ Street Address ✓ City, State, Zip	1590 Woodlake Drive. Chesterfield, MO 63017	100 North Main Street O'Fallon, MO 63366	520 Sprit of St. Louis Blvd. Chesterfield, MO 63005
Reference Contact Person Information: ✓ Name ✓ Phone Number ✓ E-mail Address	Greg Horn, PE – District Engineer (314)453-1800 Gregory.Horn@modot.mo.gov	Jeff Schuepfer, PE - Assistant City Engineer Phone: (636)379-5491 jschuepfer@ofallon.mo.us	Russ Hoffman (636)368-4400 russh@surdex.com
Dates of Services:	Design Completed 2013 Construction Completed 2015	Design Completed - Current	2016
If service/contract has terminated, specify reason:	Project has been built.		
Dollar Value of Services	\$1,500,000	\$1,400,000	\$13,500
Description of Services Performed including the Following: ✓ Acquisition of Digital Orthoimagery			
✓ Acquisition of Digital Orthoimagery	Project Tasks I-70 Ramp Reconfiguration in Downtown St. Louis Property & Topographic Surveys Coordination with MoDOT, IDOT, City of St. Louis, CityArchRiver2015, and other Adjacent Projects Corridor Practical Design/Value Cost Savings	Project Tasks I-70 Ramp Reconfiguration I-70 Outer Road Dsigns Property & Topographic Surveys Coordination with MoDOT, St. Charles County, and other Adjacent Projects	Surveying – Setting Ground Control Points



Vendor Name or Subcontractor Name: Merrick & Company			
Reference Information (Current/Prior Services Performed For:)			
References	13	14	15
Name of Reference Company:	Midland Surveying –GIS Missouri DOT	USDA, NRC Southwest Oklahoma	State of North Carolina
Address of Reference Company ✓ Street Address ✓ City, State, Zip	501 N Market St. Maryville, MO 64468	USDA, Natural Resource Conservation Service URS Corporation	ESP & Associates 3475 Lakemont Blvd. Fort Mill, SC 29708
Reference Contact Person Information: ✓ Name ✓ Phone Number ✓ E-mail Address	Adam Teale (Midland) (660)582-8633 Bradley McCloud (DOT) (573)526-2955 Bradley.mccloud@modot.mo.gov	Jennifer Williams (303)740-3901 Jennifer.I.williams@urs.com Gary Utley, USDA-NRCS (405)742-1229 Gary.utley@ok.usda.gov	Harold Rempel, Senior Geospatial Manager (803) 835-0851 Email: hrempe1@essassociates.com
Dates of Services:	2012 & 2013	2012	2014
If service/contract has terminated, specify reason:			No
Dollar Value of Services	\$604,000 (2013) 396,000. (2012)	\$3M (Merrick and Surdex)	
Description of Services Performed Including the Following:			
<ul style="list-style-type: none"> ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	<p>Merrick & Company partnered with Midland Surveying of Marysville, MO in 2012 and 2013 to provide ground and aerial survey services to included analytics, planimetric compilation, terrain modeling, orthoimagery, ground surveying, and Light Detection and Ranging (LIDAR) to be used for preliminary highway design and re-routing. Separate sites throughout the state:</p> <p>LIDAR Density: 0.3' GSD, 1' GSD, and 2' GSD.</p> <p>2012: 51.8 line miles of Highway 2013: 90.9 line miles Corridor with of 600'</p> <p>Aerial imagery will be delivered at a 0.5' pixel resolution delivered in .las 1.2 format; planimetric and DTM data were delivered in Microstation and GeoPak formats.</p> <p>2012: Breaklines are being compiled to help enforce the LIDAR surface.</p>	<p>Merrick and Surdex were contracted by URS to perform airborne mapping services covering approximately 20,000 sq. miles of various watersheds in Oklahoma in support of the US Department of Agriculture's Natural Resources Conservation Service (USDA-NRCS). The purpose of this project was to generate digital elevation models and contours for use in hydraulic/hydrologic models.</p> <p>Contract Value:</p>	<p>The objective of this project was to acquire digital elevation data for 20 Counties in the Eastern Piedmont area using airborne Light Detection and Ranging (LIDAR) to include LIDAR intensity returns suitable for post-processing of LIDAR data as well as feature extraction. Merrick and Surdex collected the data at 2 points per square meter with a nominal Post spacing of .7 meters.</p>



Vendor Name or Subcontractor Name: <u>Harris Corporation</u>			
Reference Information (Current/Prior Services Performed For:)			
References	16	17	18
Name of Reference Company:	State of North Carolina/ ESP Associates	Dewberry Consultants, LLC	CIRGIS, Inc.
Address of Reference Company ✓ Street Address ✓ City, State, Zip	ESP & Associates 3475 Lakemont Blvd. Fort Mill, SC 29708	1000 N. Ashley Dr. Suite 801 Tampa, FL 33602	1047 Cove Street Ventura, CA 93001
Reference Contact Person Information: ✓ Name ✓ Phone Number ✓ E-mail Address	Harold Rempel, Senior Geospatial Manager (803) 835-0851 hrempel@essassociates.com	Amar Nayegandhi 813-421-8642 anayegandhi@dewberry.com	Hasan Kasraie (805) 340-4744 terrain@cirgis.org
Dates of Services:	2016 - Ongoing	2016- Ongoing	
If service/contract has terminated, specify reason:			
Dollar Value of Services	>1.5 Million	>1.4 Million	
Description of Services Performed including the following:	✓ Acquisition of LIDAR Elevation Data 9,000 10sq. miles of Geiger-mode LIDAR data acquisition at ≥30 ppsm and deliver calibrated point cloud data with 9.25cm RMSE and a 1 foot contour accuracy. <ul style="list-style-type: none"> Acquisition of High Density Geiger-mode LIDAR Processing to Calibrated Point Cloud 	✓ Acquisition of LIDAR Elevation Data Upcoming Spring 2017 LIDAR Collection and Processing for 6 Counties (4 Counties in Illinois and 2 Counties in Wisconsin) on the USGS 3DEP Program, 20 ppm, 4,000 sq. miles Ongoing 8104 sq. miles acquisition of LIDAR data within South Dakota and delivery of calibrated point clouds at 8 ppsm with 10cm RMSE vertical and 30cm RMSE horizontal accuracy.	✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR 512 sq. miles of LIDAR data collection at 20 ppsm and delivery of classified point cloud and Digital Elevation data at 8ppsm with 10cm vertical accuracy.
✓ Acquisition of LIDAR Elevation Data			



Vendor Name or Subcontractor Name: <u>ESP & Associates, Inc.</u>			
Reference Information (Current/Prior Services Performed For:)			
References	19	20	21
Name of Reference Company:	State of North Carolina	North Carolina FMP Phases 2, 4 and 5 (2014-2018) QL2 and QL1 LIDAR	Iowa DOT On Call Surveying Services
Address of Reference Company ✓ Street Address ✓ City, State, Zip	20322 Mail Service Center Raleigh, NC 27699-0322	4218 Mail Service Center Raleigh, NC 27699	P.O. Box 1159 Ankeny, IA 50023
Reference Contact Person Information: ✓ Name ✓ Phone Number ✓ E-mail Address	Tim Johnson 919.754.6588 tim.johnson@nc.gov	John Dorman 919-825-2296 jdorman@ncem.org	John F. Barber 515-964-2020 jbarber@snyder-associates.com
Dates of Services:	2012-Present	2014 -- Present	June 2011 -- May 2012
If service/contract has terminated, specify reason:			
Dollar Value of Services	\$689,000 (2015)		\$111,388
Description of Services Performed Including the Following:	✓ Acquisition of Digital Orthoimagery	✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR	✓ Acquisition of LIDAR Elevation Data
✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR	Surdex has served as a prime contractor to the State of North Carolina for digital orthophotography for five consecutive years (2012-2016). Project deliverables included 6" color digital orthoimagery in GeoTiff / TFW format, mosaic cutlines in .SHP format and project metadata. ESP was a subcontractor to Surdex on this contract for ground control.	ESP, with support of sub's Surdex, HARIS, worked with NCFMP to collect Quality Level 2 (QL2) LIDAR across the State of North Carolina. Phase II entailed the collection and processing of LIDAR for 20 counties in eastern North Carolina, covering an area of approximately 13,000 square miles. In addition, ESP performed Gelger-mode LIDAR data collection and processing and the generation of Hydro DEM raster products for Phase 4 covering over 9,000 square miles. QA/QC management services as well as processing of LIDAR products.	ESP supported Snyder & Associates on their Iowa DOT On Call Engineering contract providing Tripod Static Scanning, 3D Laser Scanning and Mobile Mapping services on the following projects under this contract: Interstate 35 interchange with US 30; Warren / Clarke County - I-35; and Story County - US 30.



EXHIBIT C: Expertise of Key Personnel

The resumes are following this table. The table represents the resumes that are included in our response.

Project Staff Experience		
Name	Years Exp.	Role
Shirley Corporation (Prime Contractor)		
Wade Williams, CP	20	Director of Project Management, ASPRS Certified Photogrammetrist
Loran Chick, PLS	25	Project Manager, PLS
Jim Gottgetreu	36	Project Manager
Steve Kasten, CP, RLS	33	Survey and Photogrammetric Engineering, ASPRS Certified Photogrammetrist, RLS
Mike Mueller	30	Senior VP of Operations
Doug Crane	20	Chief Flight Operations Manager
Jason Pohlman	9	Flight Acquisition Manager
Colby Forke, CP	17	Director of Image Processing, ASPRS Certified Photogrammetrist
Brad Barker	16	Director of 3D Mapping
David Mason & Associates (Survey)		
Ronnie Lowe, PLS	33	Director of Survey, MO/IL RLS
EFK Mohr (Survey)		
Randy Brickley, PLS	35+	Project Surveyor, MO/IL RLS
Chris Ferrante, PLS	35+	Surveying Manager, MO/IL RLS
Sherrick & Company (LIDAR Acquisition and Processing)		
Brian Holzworth, GISP	16	Project Manager - LIDAR, GISCI Certified GIS Professional
Bruce Audey GISP	16	LIDAR Technician Lead, Certified Geographic Information Systems Professional (GISP)
Harris Corporation (Geiger-mode LIDAR)		
Jennifer Nlx	21	Project Manager, ASPRS Certified Photogrammetrist
Mark Romano	30	LIDAR Product Manager
Connie L. Stanley	30	Quality Control/Assurance Manager, Certified Mapping, Charting and Geodesy Professional
James M. Earwood	15	Geiger-mode LIDAR Production Manager
Harold W. Rempel, CP, GISP	25	Senior Geospatial Manager, ASPRS Certified Photogrammetrist, Oregon Professional Photogrammetrist, Virginia Surveyor Photogrammetrist, Geographic Information Systems Professional
ESP (Mobile LIDAR)		
Ryan Lavery	7	Geospatial Analyst
Michael Baranowski	7	Geospatial Analyst


Title of Position: Surdex Corporation: Director of Project Management

Name of Person:	Wade Williams, CP
<i>Educational Degree (s): Include college or university, major, and dates</i>	BS Geography and Cartography, Missouri State University (1995)
<i>License(s)/Certification(s), number(s), expiration date(s), if applicable:</i>	ASPRS Certified Photogrammetrist, #1038 (1997)
<i>Specialized Training Completed.</i>	N/A
<i>Number of years' experience in area of service proposed to provide:</i>	20 Years
<i>Describe person's relationship to vendor. If employee, number of years. If subcontractor, describe other/past working relationships</i>	Surdex Employee: 20 years Title/Role: Director of Project Management
<i>Describe this person's responsibilities over the past 12 months.</i>	Wade has been a Project Manager with Surdex for the past XX year's, just recently he has been promoted to Director of Project Management. As PM, he oversees assigned projects and manages the scopes of work for various clients. This involves managing in-house communications regarding all aspects of project execution including client communication, project planning, surveying, aerial photography acquisition, scanning, aerial triangulation, LIDAR processing, planimetric/ topographic feature collection and digital orthoimagery production. As Director Wade will oversees the project management staff, ensuring all projects remain on schedule and all deliverables meet specifications.
<i>Previous employer(s), positions, and Dates</i>	N/A
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model(DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Unes ✓ Planimetric Mapping 	<p>Role: Project Manager Project Involvement: managing communications regarding all aspects of project execution including client communication, project planning, surveying, aerial photography acquisition, scanning, aerial triangulation, LIDAR processing, planimetric/ topographic feature collection and digital orthoimagery production. Listed below are just a few of the most recent photogrammetric projects Steve has been involved in:</p> <p>Project Experience:</p> <ul style="list-style-type: none"> • Missouri, Boone County Consortium Digital Orthoimagery and Mapping Project (2016) • Missouri, City of Columbia LIDAR and Planimetric Mapping (2016) • Missouri, Mid America Regional Council (MARC) Digital Orthoimagery Project (2016) • St. Louis Metropolitan Sewer District (MSD) Planimetric Mapping (2014) • Illinois State Geological Survey (ISGS) LIDAR Acquisition and Processing Project (2016 & 2017) • Illinois, Western Illinois University Digital Orthoimagery Project (2015) • Florida, Collier County Digital Orthoimagery Project (2016) • Florida, Palm Beach County Digital Orthoimagery and Mapping (2015) • North Carolina City of Raleigh Orthoimagery and Planimetric Update Project (2014-2017) • North Carolina Statewide Digital Orthoimagery Projects (2013-2017) • North Carolina State Phase II LIDAR Project (2014) • Oklahoma, USDA-NRCS East Central LIDAR Project (2012)



Title of Position: <u>Surdex Corporation: Project Manager</u>	
Name of Person:	Loran Chlck, MO PLS
Educational Degree (s): include college or university, major, and dates	BS, Business Management, Northwest Missouri State University (1988)
License(s)/Certification(s), number(s), expiration date(s), if applicable:	Professional Land Surveyor: Missouri #2001001907
Specialized Training Completed.	Certificate of Project Management from Saint Louis University, Missouri
Number of years' experience in area of service proposed to provide:	25 Years
Describe person's relationship to vendor. If employee, number of years. If subcontractor, describe other/past working relationships	Surdex Employee: 2 years Title/Role: Project Manager
Describe this person's responsibilities over the past 12 months.	As PM, Loran oversees assigned projects and manages the scopes of work for various clients. This involves managing in-house communications regarding all aspects of project execution including client communication, project planning, surveying, aerial photography acquisition, scanning, aerial triangulation, LIDAR processing, planimetric/ topographic feature collection and digital orthoimagery production.
Previous employer(s), positions, and Dates	Missouri Department of Transportation, Highway Liaison Surveyor, 1992-2006 Eagle Point Software, Product Manager, 2006-2011 St. Louis University Missouri, Project Coordinator, 2012-2015
<i>Family member's name, relationship to you, and experience</i>	<i>Clearly identify the duties and responsibilities of the experience</i>
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model(DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	<p>Role: Project Manager</p> <p>Project Involvement: managing communications regarding all aspects of project execution including client communication, project planning, surveying, aerial photography acquisition, scanning, aerial triangulation, LIDAR processing, planimetric/ topographic feature collection and digital orthoimagery production. Listed below are just a few of the most recent photogrammetric projects Steve has been involved in:</p> <p>Project Experience:</p> <ul style="list-style-type: none"> • Missouri, State of Missouri Statewide Digital Orthoimagery Project (2016) • Missouri, St. Louis Imagery Consortium Orthoimagery Project (2016) • Missouri and Illinois, East-West Gateway Digital Orthoimagery Project (2012 & 2015) • Missouri Department of Transportation for EFK Moen, Contour and Planimetric mapping (2016)


 Title of Position: Surdex Corporation: Project Manager

Name of Person:	Jim Gottgetreu
Educational Degree (s): include college or university, major, and dates	BS, Cartography and GIS, University of Wisconsin Madison (1979)
License(s)/Certification(s), number(s), expiration date(s), if applicable:	
Specialized Training Completed.	
Number of years' experience in area of service proposed to provide:	36 Years
Describe person's relationship to vendor. If employee, number of years. If subcontractor, describe other/past working relationships	Surdex Employee: 2 years Title/Role: Project Manager
Describe this person's responsibilities over the past 12 months.	As PM, Jim oversees assigned projects and manages the scopes of work for various clients. This involves managing in-house communications regarding all aspects of project execution including client communication, project planning, surveying, aerial photography acquisition, scanning, aerial triangulation, LIDAR processing, planimetric/ topographic feature collection and digital orthoimagery production.
Previous employer(s), positions, and Dates	Walker & Associates, Stereo Compiler (4 years) Sanborn Mapping Company, Project Manager (27 years) Towill, Inc., Processing Manager (3 years)
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model(DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	<p>Role: Project Manager</p> <p>Project Involvement: managing communications regarding all aspects of project execution including client communication, project planning, surveying, aerial photography acquisition, scanning, aerial triangulation, LIDAR processing, planimetric/ topographic feature collection and digital orthoimagery production. Listed below are just a few of the most recent photogrammetric projects Steve has been involved in:</p> <p>Project Experience:</p> <ul style="list-style-type: none"> • Illinois, Department of Transportation Statewide Orthoimagery Project (2016-2017) • Illinois State Geological Survey (ISGS) LIDAR Acquisition and Processing Project (2016 & 2017) • Missouri, Mid America Regional Council (MARC) Digital Orthoimagery Project (2016) • Minnesota, Dakota County Digital Orthoimagery (2016) • Porto Rico Digital Orthoimagery Collection Project (2016-2017) • Wisconsin DNR Digital Orthoimagery Project (2015, 2016) • Microsoft Digital Orthoimagery Collection Project (2015) • USDA, NAIP, Digital Orthoimagery Project (2016)



Title of Position: Surdex Corporation: Sr. VP of Survey and Photogrammetric Engineering Design	
Name of Person:	Steve Kasten, CP RLS
Educational Degree (s): Include college or university, major, and dates	BS, Earth Science and Cartography, Purdue University (1987) MS, Civil Engineering Photogrammetry Southern University Edwardsville (1983)
License(s)/Certification(s), number(s), expiration date(s), if applicable:	ASPRS Certified Photogrammetrist, #1038 (1997) North Carolina Professional Land Surveyor, #L-4106 Oregon Professional Photogrammetrist, #80665RPP South Carolina Professional Photogrammetric Land Surveyor, #24303 Virginia Surveyor Photogrammetrist, #000119 Florida Professional Surveyor and Mapper License, #LS6683
Specialized Training Completed.	N/A
Number of years' experience in area of service proposed to provide:	33 Years
Describe person's relationship to vendor. If employee, number of years. If subcontractor, describe other/past working relationships	Surdex Employee: 18 years Title/Role: Sr. Vice President of Survey and Photogrammetric Engineering Design
Describe this person's responsibilities over the past 12 months.	As the Sr. Vice President of Survey and Photogrammetric Engineering Design, Steve is responsible for the photogrammetric engineering application development, photogrammetric mapping, geodesy, cartography and surveying. He supports the project design of Surdex's photogrammetric projects, and is responsible for the airborne GPS survey data and triangulation for all aerial imagery and LIDAR projects. Steve manages the photogrammetric mapping contract task orders from the USACE, St. Louis District. For the past four years Steve has been involved with the use and production of geospatial data from our UAS systems and has processed the using numerous software products.
Previous employer(s), positions, and Dates	N/A
Qualifications	
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model(DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	Role: Survey and Photogrammetric Engineering Design Project Involvement: Steve has been responsible for the photogrammetric control for all types of photogrammetry project for Surdex. He is responsible for developing algorithms for sensor modeling, post processing of GPS data, error propagation, photogrammetric data reduction, and implementing algorithms for both digital imagery and Lidar elevation data. Listed below are just a few of the most recent photogrammetric projects Steve has been involved in: Project Experiences: <ul style="list-style-type: none"> • Missouri, State of Missouri Statewide Digital Orthoimagery Project (2016) • Missouri, Boone County Consortium Digital Orthoimagery and Mapping Project (2016) • Missouri, St. Louis Imagery Consortium Orthoimagery Project (2016) • Missouri, Mid America Regional Council (MARC) Digital Orthoimagery Project (2016) • Iowa, Statewide Digital Orthoimagery Project (2016) • Illinois, Department of Transportation Statewide Orthoimagery Project (2016-2017) • Illinois State Geological Survey (ISGS) LIDAR Acquisition and Processing Project (2016 & 2017) • Iowa, DNR (DOT) LIDAR Acquisition and Processing Project (2014-2015) • Missouri Department of Transportation for EFK Moen, Contour and Planimetric mapping (2016) • Minnesota, Dakota County Digital Orthoimagery (2016) • Porto Rico Digital Orthoimagery Collection Project (2016-2017) • Wisconsin DNR Digital Orthoimagery Project (2015, 2016) • USDA NAIP, Digital Orthoimagery Project (2016)



Title of Position: <u>Surdex Corporation: Sr. VP of Operations</u>	
Name of Person:	Mike Mueffer
Educational Degree (s): Include college or university, major, and dates	BS, Mechanical Engineering, University of Missouri Rolla
License(s)/Certification(s), number(s), expiration date(s), if applicable:	
Specialized Training Completed.	N/A
Number of years' experience in area of service proposed to provide:	30 Years
Describe person's relationship to vendor. If employee, number of years. If subcontractor, describe other/past working relationships	Surdex Employee: 1 years Title/Role: Vice President of Production and Operations
Describe this person's responsibilities over the past 12 months.	<p>As senior Vice President of Production and Operations for Surdex Corporation, Mike directly supervises and coordinates all phases of production of every project. Mike will be in direct contact with the Directors of the Image Process Services and 3D Mapping departments to ensure projects have the resources and are on schedule.</p> <p>Mike also is responsible for resource allocation and scheduling for survey; aerial photography; fully analytical aerial triangulation (FAAT); stereo mapping; digital imaging; systems management; GIS and GIS data conversion; estimating; and R&D. Mike utilizes Microsoft Project software to track resources and progress of each project, including equipment, personnel and cost. Mike personally reviews quality control reports after each phase of a project, including flight, survey, triangulation, photo lab, digital mapping, digital imaging and GIS development. Mike will be instrumental in Surdex's adaptation of ISO 9000 Quality Assurance Standards in the next year by building the corporate environment for quality, maintaining procedures manual and evaluates suggestions for continuous improvement. He provides a single point of contact for all departments and is an information hub for crews in the field. He works closely with project management to assure that your needs are met for your project.</p>
Previous employer(s), positions, and Dates	N/A
Previous employer(s), positions, and Dates	
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model (DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	<p>Role: Operations Manager</p> <p>Project Involvement: directly supervises and coordinates all phases of production of every project. Listed below are just a few of the projects he has directly worked on:</p> <ul style="list-style-type: none"> • Missouri, St. Louis Imagery Consortium Orthoimagery Project (2016) • Iowa, Statewide Digital Orthoimagery Project (2016) • Illinois, Department of Transportation Statewide Orthoimagery Project (2016-2017) • Illinois State Geological Survey (ISGS) LIDAR Acquisition and Processing Project (2016 & 2017) • Missouri Department of Transportation for EFK Moen, Contour and Planimetric mapping (2016) • Porto Rico Digital Orthoimagery Collection Project (2016-2017) • USDA NAIP, Digital Orthoimagery Project (2016)



Title of Position: <u>Surdex Corporation: Chief Flight Operations Manager</u>	
Name of Person:	Doug Crane
Educational Degree (s): include college or university, major, and dates	BS, Aeronautical Engineering from Purdue University MS, Aeronautical Engineering from the Air Force Institute of Technology Graduate of the US Naval Test Pilot School
License(s)/Certification(s), number(s), expiration date(s), if applicable:	
Specialized Training Completed.	Decades of experience in flight test and program management for the US Navy
Number of years' experience in area of service proposed to provide:	20 Years (US Navy Flight Test Officer)
Describe person's relationship to vendor. If employee, number of years. If subcontractor, describe other/past working relationships	Surdex Employee: ~1 years Title/Role: Chief Flight Operations Manager
Describe this person's responsibilities over the past 12 months.	Doug is responsible for the personnel (pilot's) that operate our aircraft for aerial acquisition projects. As Chief Pilot, Doug is responsible managing pilot's schedules and availability and knowledge of flight specifications for each mission. He is engaged in the pre-flight planning preparations that include monitoring the weather conditions, review of aerial flight plans for LIDAR and photography capture, adherence to overall project specifications, proper equipment and material handling procedures, pre- and post-flight status reporting, and all FAA notices and air space designations along with any NOTAMs (notices to airmen)
Previous employer(s), positions, and Dates	US Navy, Boeing, St. Louis test flying the new production F/A-18 Super Hornets.
Describe the individual's qualifications for the position.	Clearly identify the experience, training, dates, etc. for the person's job and extent of involvement in the project.
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model (DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	<p>Role: Chief Flight Operations Manager</p> <p>Project Involvement: manage the acquisition pilots responsibilities for the successful flight mission to meet each projects specifications: Listed below are just a few of the successful projects that have been flown by our pilots:</p> <ul style="list-style-type: none"> • Missouri, State of Missouri Statewide Digital Orthoimagery Project (2016) • Missouri, Boone County Consortium Digital Orthoimagery and Mapping Project (2016) • Missouri, St. Louis Imagery Consortium Orthoimagery Project (2016) • Missouri, Mid America Regional Council (MARC) Digital Orthoimagery Project (2016) • Iowa, Statewide Digital Orthoimagery Project (2016) • Illinois, Department of Transportation Statewide Orthoimagery Project (2016-2017) • Illinois State Geological Survey (ISGS) LIDAR Acquisition and Processing Project (2016 & 2017) • Iowa, DNR (DOT) LIDAR Acquisition and Processing Project (2014-2015) • Missouri Department of Transportation for EFK Moen, Contour and Planimetric mapping (2016) • Minnesota, Dakota County Digital Orthoimagery (2016) • Porto Rico Digital Orthoimagery Collection Project (2016-2017) • Wisconsin DNR Digital Orthoimagery Project (2015, 2016) • USDA NAIP, Digital Orthoimagery Project (2016)


 Title of Position: **Surdex Corporation: Flight Acquisition Manager**

Name of Person:	Jason Pohlman
Educational Degree (s): include college or university, major, and dates	Some college
License(s)/Certification(s), number(s), expiration date(s), if applicable:	N/A
Specialized Training Completed.	Leica Systems: Technical Training on the operations of the aerial sensor
Number of years' experience in area of service proposed to provide:	9 Years
Describe person's relationship to vendor. If employee, number of years. If subcontractor, describe other/past working relationships	Surdex Employee: 9 years Title/Role: Flight Acquisition Manager
Describe this person's responsibilities over the past 12 months.	Jason manages the staffing/personnel for each acquisition mission and the acquisition sensor equipment. This includes the installation of the sensors into an aircraft and maintaining the maintenance and repair schedules. He oversees the personnel for training on the sensor hardware and software. He maintains a clear understanding of flight capture conditions, internal/external priorities and aerial sensor limitations, installations, calibrations as well as GPS/IMU data collections.
Previous employer(s), positions, and Dates	N/A
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model(DTM) to produce quality orthomimagery ✓ Acquisition of Digital Orthomimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from UDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	Role: Flight Acquisition Manager Project Involvement: prepares and or reviews each projects aerial flight plans for the capture of imagery or LIDAR data. He oversees the adherence to overall project specifications by monitoring weather conditions, confirming the proper equipment and material, and the proper pre and post flight status reporting is completed. Listed below are just a few of the projects he has directly worked on: <ul style="list-style-type: none"> • Missouri, State of Missouri Statewide Digital Orthomimagery Project (2016) • Missouri, Boone County Consortium Digital Orthomimagery and Mapping Project (2016) • Missouri, St. Louis Imagery Consortium Orthomimagery Project (2016) • Missouri, Mid America Regional Council (MARC) Digital Orthomimagery Project (2016) • Iowa, Statewide Digital Orthomimagery Project (2016) • Illinois, Department of Transportation Statewide Orthomimagery Project (2016-2017) • Illinois State Geological Survey (ISGS) LIDAR Acquisition and Processing Project (2016 & 2017) • Iowa, DNR (DOT) LIDAR Acquisition and Processing Project (2014-2015) • Missouri Department of Transportation for EFK Moen, Contour and Planimetric mapping (2016) • Minnesota, Dakota County Digital Orthomimagery (2016) • Porto Rico Digital Orthomimagery Collection Project (2016-2017) • Wisconsin DNR Digital Orthomimagery Project (2015, 2016) • USDA NAIP, Digital Orthomimagery Project (2016)



Title of Position: <u>Surdex Corporation: Director of Image Processing</u>	
Name of Person:	Colby Forke
Educational Degree (s): include college or university, major, and dates	BS Geography, University of Nebraska (1999)
License(s)/Certification(s), number(s), expiration date(s), if applicable:	ASPRS Certified Photogrammetrist #1598 (2016)
Specialized Training Completed.	Adoption of ISO 9001 Quality Assurance Standards
Number of years' experience in area of service proposed to provide:	17 Years
Describe person's relationship to vendor. If employee, number of years. If subcontractor, describe other/past working relationships	Surdex Employee: 15 years Title/Role: Director of Image Processing
Describe this person's responsibilities over the past 12 months.	Colby supervises and coordinates all phases of production that includes image processing, ortho-mosaic, and imagery quality control management. Colby works with the imagery and orthoimagery managers daily to coordinate production tasks, set priorities and assist with resource management. Colby directly reports to Michael Mueller, the Sr. VP of Operations, on resource allocations and progress of each project. He works closely with each project manager to assure our clients' needs are met for every project.
Previous employer(s), positions, and Dates	N/A
Describe your previous employer's name, address, phone number, and dates of employment in the event of a conflict of interest.	Colby has only one previous employer, Surdex Corporation, which he has worked for since 2001.
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model(DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from UDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	<p>Role: Director of Image Processing</p> <p>Project Involvement: supervises and coordinates all phases of production that includes image processing, ortho-mosaic, and imagery quality control management. He works closely with each project manager to assure our clients' needs are met for every project. Listed below are just a few of the projects he has directly worked on:</p> <ul style="list-style-type: none"> • Missouri, State of Missouri Statewide Digital Orthoimagery Project (2016) • Missouri, Boone County Consortium Digital Orthoimagery Project (2016) • Missouri, St. Louis Imagery Consortium Orthoimagery Project (2016) • Missouri, Mid America Regional Council (MARC) Digital Orthoimagery Project (2016) • Iowa, Statewide Digital Orthoimagery Project (2016) • Illinois, Department of Transportation Statewide Orthoimagery Project (2016-2017) • Minnesota, Dakota County Digital Orthoimagery (2016) • Porto Rico Digital Orthoimagery Collection Project (2016-2017) • Wisconsin DNR Digital Orthoimagery Project (2015, 2016) • USDA NAIP, Digital Orthoimagery Project (2016)



Title of Position: Surdex Corporation: Director of 3D Mapping

Name of Person:	Brad Barker
Educational Degree (s): Include college or university, major, and dates	BS Cartography and Map Technology, Southwest Missouri State University (1998)
License(s)/Certification(s), number(s), expiration date(s), if applicable:	N/A
Specialized Training Completed:	Adoption of ISO 9001 Quality Assurance Standards
Number of years' experience in area of service proposed to provide:	21 Years
Describe person's relationship to vendor. If employee, number of years. If subcontractor, describe other/past working relationships	Surdex Employee: 85 years Title/Role: Director of 3D Mapping
Describe this person's responsibilities over the past 12 months.	Brad's primary responsibilities include cartographic finishing and design of geographic information system database conversion applications to support CAD/GIS database generation. He is responsible for digital orthophoto and CAD production including data input, editing and plotting. Brad has expertise in CAD/GIS programs including the full ESRI suite of software products. He has intimate knowledge of the entire LIDAR project life cycle which includes planning, acquisition, ABGPS/IMU processing, initial LIDAR processing, manual and automated classification and editing. He is also experienced with various software packages from his previous photogrammetric mapping responsibilities.
Previous employer(s), positions, and Dates	N/A
	<p>Role: Quality Assurance / Quality Control (QA/QC)</p> <p>Project Involvement: supervises and coordinates quality assurance and control product quality control management. He works closely with each project manager to assure our clients' needs are met for every project. Listed below are just a few of the projects he has directly worked on:</p> <ul style="list-style-type: none"> • Missouri, State of Missouri Statewide Digital Orthoimagery Project (2016) • Missouri, Boone County Consortium Digital Orthoimagery and Mapping Project (2016) • Missouri, St. Louis Imagery Consortium Orthoimagery Project (2016) • Missouri, Mid America Regional Council (MARC) Digital Orthoimagery Project (2016) • Iowa, Statewide Digital Orthoimagery Project (2016) • Illinois, Department of Transportation Statewide Orthoimagery Project (2016-2017) • Illinois State Geological Survey (ISGS) LIDAR Acquisition and Processing Project (2016 & 2017) • Iowa, DNR (DOT) LIDAR Acquisition and Processing Project (2014-2015) • Missouri Department of Transportation for EFK Moen, Contour and Planimetric mapping (2016) • Minnesota, Dakota County Digital Orthoimagery (2016) • Porto Rico Digital Orthoimagery Collection Project (2016-2017) • Wisconsin DNR Digital Orthoimagery Project (2015, 2016) • USDA NAIP, Digital Orthoimagery Project (2016)
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model(DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	



Title of Position: <u>David Mason & Associates: Director of Survey</u>	
Name of Person:	Ronnie Lowe, PLS
Educational Degree (s): Include college or university, major, and dates	University of Missouri-Rolla – Surveying Jefferson College of Applied Science – Civil Engineering & Applied Science in Civil Engineering & Construction Technology
License(s)/Certification(s), number(s), expiration date(s), if applicable:	Missouri – 002557 December 31, 2017 Illinois – 035.003363 November 30, 2018
Specialized Training Completed.	
Number of years' experience in area of service proposed to provide:	33 years
Describe person's relationship to vendor. If employee, number of years. If subcontractor, describe other/past working relationships	Subcontractor: David Mason & Associates Title/Role: Director of Survey / Field Survey As subcontractor, DMA has worked with Surdex on previous Missouri Statewide projects and provided horizontal/vertical control on other aerial photogrammetry and LIDAR projects.
Describe this person's responsibilities over the past 12 months.	Division Manager/Project Manager for David Mason & Associates
Previous employer(s), positions, and Dates	21 years with David Mason & Associates (1996-current) 12 years with General Consultants (1984-1996)
Detailed Description of Experience	
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model(DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	<p>Role: Survey</p> <p>Project Involvement: Clearly identify the experience, provide dates, describe the person's role and extent of involvement in the experience, provide horizontal/vertical control. Processing GPS data and provide QA/QC</p>


 Title of Position: EFK Moen: Project Surveyor

Name of Person:	Randy Brickey, PLS
Educational Degree (s): Include college or university, major, and dates	Missouri Western State University, Bachelor of Science in Technology/Construction Engineering Technology
License(s)/Certification(s), number(s), expiration date(s), if applicable:	Registered Professional Land Surveyor Missouri – 2620 & Illinois – 3441
Specialized Training Completed.	
Number of years' experience in area of service proposed to provide:	35+ years
Describe person's relationship to vendor. If employee, number of years. If subcontractor, describe other/past working relationships	Subcontractor: EFK Moen Role: Project Survey, Field Survey As subcontractor, have managed and provided horizontal/vertical control on other aerial photogrammetry and LIDAR projects for Surdex Corporation.
Describe this person's responsibilities over the past 12 months.	Randy has successfully provided project surveyor duties on over \$1,000,000 of surveying work over the past 12 months
Previous employer(s), positions, and Dates	Various Surveying Firms since 1985 Randy has been a Project Surveyor at EFK Moen since 2015.
Identify specific photogrammetric products and services to be provided by the person(s) listed above.	
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model(DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	Role: Survey Project Involvement: Randy routinely works with all types of photogrammetry files <ul style="list-style-type: none"> • Randy routinely works with elevation data from LIDAR Data and or traditional photogrammetry files • Randy routinely works Digital Terrain Models from LIDAR Data • Randy routinely works LIDAR Elevation Models • Randy routinely creates Contour Lines from traditional survey methods. • Randy routinely creates Contour Lines from traditional survey methods.



Title of Position: <u>EFK Moen: Surveying Manager</u>	
Name of Person:	Chris Ferrante, PLS
Educational Degree (s): Include college or university, major, and dates	St. Louis Community College, Assoc. in Applied Science/Civil Engineering, 1984
License(s)/Certification(s), number(s), expiration date(s), if applicable:	Registered Professional Land Surveyor Missouri – 002494 & Illinois – 35003564
Specialized Training Completed.	
Number of years' experience in area of service proposed to provide:	35+ years
Describe person's relationship to vendor. If employee, number of years. If subcontractor, describe other/past working relationships	Subcontractor: EFK Moen Role: Survey Manager, Field Survey Surdex has worked as a subcontractor to EFK Moen on Missouri DOT projects for aerial imagery and mapping.
Describe this person's responsibilities over the past 12 months.	Chris has successfully led his department of eight staff members on over \$1,000,000 of surveying work over the past 12 months. Chris has been the Surveying Manager at EFK Moen since 2001.
Previous employer(s), positions, and Dates	Volz Engineering 1983 - 2001
Detailed Description of Proposed Services	
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model (DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	<p>Chris routinely works with all types of photogrammetry files</p> <ul style="list-style-type: none"> • DTM task that most traditional survey filed personnel do not work with daily. • Field Survey for acquisition project, this is a task that most traditional survey filed personnel do not work with daily. • Chris routinely works with elevation data from LIDAR Data and or traditional photogrammetry files • Chris routinely works Digital Terrain Models from LIDAR Data • Chris routinely works LiDAR Elevation Models • Chris routinely creates Contour Lines from traditional survey methods. • Chris routinely creates Contour Lines from traditional survey methods.



Title of Position: Merrick & Company: Project Manager - LIDAR	
Name of Person:	Brian Holzworth, GISP
Educational Degree (s): Include college or university, major, and dates	BA, Political Science; Minor History; Minor East European Affairs, (1993) Hickam AFB, Radar Imagery Analysis, (1991) Goodfellow AFB, Imagery Interpretation, (1988)
License(s)/Certification(s), number(s), expiration date(s), if applicable:	<ul style="list-style-type: none"> ■ GISCI Certified GIS Professional, #00057054 ■ Project Management Institute (PMI) ■ Working toward Project Management Professional (PMP) certification ■ American Society for Photogrammetry & Remote Sensing (ASPRS) ■ Working toward Certified Mapping Scientist (CMS) certification
Specialized Training Completed.	<ul style="list-style-type: none"> • Environmental Systems Research Institute (ESRI) ArcInfo 8.0, 1999 • Defense Security Service FSO Program Management, 1999 • PMI/ESI Managing Projects In Organizations, 1999 • NIMA Outsourcing, 1999, 1998, 1997 • Geographic Information Systems for Local Government, 1998 • Managing Through Empowerment, 1997 • Management Problems of the Technical Person In Leadership, 1996 • NIMA Validator, 1995 • VPF Conversion, 1995 • Advanced ArcInfo, 1995 • VMAP ArcInfo, 1994 • Franklin Time Management, 1994
Number of years' experience in area of service proposed to provide:	16 Years
Describe person's relationship to vendor. If employee, number of years. If subcontractor, describe other/past working relationships	Subcontractor: Merrick & Company Role: LIDAR Fixed-wing and helicopter LIDAR acquisition and processing, mobile LIDAR acquisition and processing Surdex and Merrick are under a JV and have worked together on many Orthoimagery and LIDAR Projects.
Describe this person's responsibilities over the past 12 months.	Mr. Holzworth is a project manager with 29 years of progressive experience in managing remote sensing and GIS projects. His primary responsibilities include project scope management; planning, resource management; project estimating, technical liaison between production resources and the client; contract/risk management; quality control/quality assurance execution; and revenue management.
Previous employer(s), positions, and Dates	12 Years with other firms
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model (DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	<ul style="list-style-type: none"> • 2013 Midland Surveying / Missouri Department of Transportation aerial mapping • 2011 LIDAR Survey and High Resolution Digital Images for GIS, Pantex Plant, Amarillo, Texas. • Nebraska Iowa Regional Orthophotography Consortium (NIROC) LIDAR and Planimetric mapping. • LIDAR & Imagery, Salt Creek, Nebraska. • Edwards Air Force Base, California, LIDAR / Hyperspectral Acquisition and Processing.



Title of Position: <u>Merrick & Company: LiDAR Technician Lead</u>	
Name of Person:	Bruce Audey GISP
Educational Degree (s): Include college or university, major, and dates	Centre of Geographic Sciences, in Lawrencetown, Nova Scotia, a two-year technical course in Cartography/Digital Mapping. (1998/1999)
License(s)/Certification(s), number(s), expiration date(s), if applicable:	Certified Geographic Information Systems Professional (GISP) #00061177
Specialized Training Completed.	
Number of years' experience in area of service proposed to provide:	16 Years
Describe person's relationship to vendor. If employee, number of years. If subcontractor, describe other/past working relationships	<p>Subcontractor: Merrick & Company</p> <p>Role: LIDAR Fixed-wing and helicopter LIDAR acquisition and processing, mobile LIDAR acquisition and processing</p> <p>Surdex and Merrick are under a JV and have worked together on many Orthoimagery and LIDAR Projects.</p>
Describe this person's responsibilities over the past 12 months.	Mr. Bruce Audey has more than 16 years of experience working in the Geospatial Industry which range from stereo compilation to LIDAR projects. As the Photogrammetry/LIDAR Technical Lead, Bruce works directly with Project Managers/Director of Operation in developing schedules and budgets for current projects, assists with scheduling and pricing for potential projects, supports the development & direction of the MARS® software, and also works closely with the technical staff through production to ensure that the data collected and delivered meets or exceeds industry/client standards.
Previous employer(s), positions, and Dates	12 Years with other firms
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model(DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	<ul style="list-style-type: none"> • 2014 Airborne LIDAR Collection & Processing, North Carolina. LIDAR Processing Supervisor. • 2014 USGS LIDAR Collection Processing of 12 Counties in Virginia. LIDAR Processing Supervisor • 2013 Midland Surveying / Missouri Department of Transportation aerial mapping • 2011 LiDAR Survey and High Resolution Digital Images for GIS, Pantex Plant, Amarillo, Texas. • Nebraska Iowa Regional Orthophotography Consortium (NIROC) LIDAR and Planimetric mapping. • LiDAR & Imagery, Salt Creek, Nebraska. • Edwards Air Force Base, California, LIDAR / Hyperspectral Acquisition and Processing.



Title of Position: <u>Harris Corporation: Project Manager</u>	
Name of Person:	Jennifer Nix
Educational Degree (s): Include college or university, major, and dates	BS- Geography Wright State University, Dayton, Ohio 1996 MBA- Colorado State University, Ft. Collins, CO 2014
License(s)/Certification(s), number(s), expiration date(s), if applicable:	<ul style="list-style-type: none"> • ASPRS Certified Photogrammetrist • International Software Testing Qualification Board (ISTQB)-CTFL Certification • ISO 9001- 2015 Certified Auditor
Specialized Training Completed.	ASPR Workshop Instructor
Number of years' experience in area of service proposed to provide:	21 Years
Describe person's relationship to vendor.	Harris Employee (1 Year)
Describe this person's responsibilities over the past 12 months.	Manage LIDAR Processing, Production and Delivery
Previous employer(s), positions, and Dates	DigitalGlobe 2005- 2016 Sanborn 2001-2005 Woolpert 1996- 2001
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model(DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	DigitalGlobe- Production Supervisor DigitalGlobe- Production Supervisor Sanborn & Woolpert- Photogrammetrist and Project Manager Harris Corporation and Sanborn Production Supervisor Harris Corporation- Production Supervisor Harris Corporation- Production Supervisor Sanborn & Woolpert- Photogrammetrist and Project Manager Sanborn & Woolpert- Photogrammetrist and Project Manager



Title of Position: <u>Harris Corporation; LIDAR Product Manager</u>	
Name of Person:	Mark Romano
Educational Degree (s): Include college or university, major, and dates	BS-Electrical Engineering
License(s)/Certification(s), number(s), expiration date(s), if applicable:	Florida Surveying Mapping Society (ASPRS Accreditation Program)- Co-Author Course Development & Instructions August 2012
Specialized Training Completed.	
Number of years' experience in area of service proposed to provide:	30 Years
Describe person's relationship to vendor.	Harris Employee (2.5 Years)
Describe person's responsibilities over the past 12 months.	Geiger-mode LIDAR Production Manager
Previous employer(s), positions, and Dates	ESP Associates- Director Geospatial Services 2013-2015 Earth Eye LLC - VP & CEO 2011-2013 Merrick & Company – Director of Technology 2002-2011
Specialized Experience	
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model(DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours lines ✓ Planimetric Mapping 	ESP Associates and Merrick & Company ESP Associates and Merrick & Company ESP Associates and Merrick & Company Harris Corporation and Previous Positions Harris Corporation and Previous Positions Harris Corporation and Previous Positions ESP Associates and Merrick & Company ESP Associates and Merrick & Company


Title of Position: Harris Corporation: Quality Control/Assurance Manager

Name of Person:	Connie L. Stanley
Educational Degree (s): Include college or university, major, and dates	BS –Geology, Tennessee Technological University, 1985 Geographic Information Systems Certification – Indiana University, 1992
License(s)/Certification(s), number(s), expiration date(s), if applicable:	Certified Mapping, Charting and Geodesy Professional – National Geospatial Intelligence Agency
Specialized Training Completed.	Employer-sponsored Geospatial Production Training
Number of years' experience in area of service proposed to provide:	30 Years
Describe person's relationship to vendor.	Harris Employee (13 Years)
Describe this person's responsibilities over the past 12 months.	LIDAR QA/QC Manager
Previous employer(s), positions, and Dates	Space Imaging- Manager Production Services 2001-2004 DMA- Project Manager, Terrain Analyst, Cartographer 1985-2001
<ul style="list-style-type: none"> ✓ All types of Photogrammetry projects ✓ Modifying existing Digital Terrain Model(DTM) to produce quality orthoimagery ✓ Acquisition of Digital Orthoimagery ✓ Acquisition of LIDAR Elevation Data ✓ Creation of Digital Terrain Model from LIDAR ✓ Creation of Digital Elevation Model from LIDAR ✓ Creation of Contours Lines ✓ Planimetric Mapping 	<ul style="list-style-type: none"> In all Previous Positions In all Previous Positions In all Previous Positions In all Previous Positions In all Previous Positions In all Previous Positions In all Previous Positions In all Previous Positions

CERTIFIED COPY OF ORDER

STATE OF MISSOURI

January Session of the January Adjourned

Term. 20 19

County of Boone

} ea.

In the County Commission of said county, on the 17th day of January 20 19

the following, among other proceedings, were had, viz:

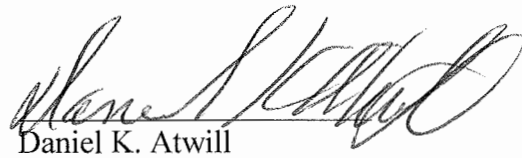
Now on this day the County Commission of the County of Boone does hereby approve the utilization of the Association of Educational Purchasing Agencies (AEPA) cooperative contract AEPA-017-B with Sumnerone, Inc., d/b/a Image Technologies of Missouri of Columbia, Missouri by the Prosecuting Attorney's Office to purchase a photocopier with maintenance.

The terms of the cooperative contract are stipulated in the attached Purchase Agreement. It is further ordered the Presiding Commissioner is hereby authorized to sign said Purchase Agreement as well as the disposal form for the Kyocera 5050 Copier, serial #PPK7907775, fixed asset tag 17873.

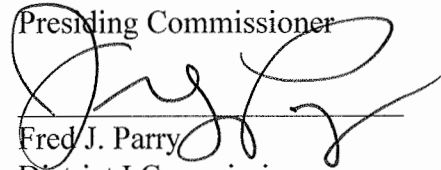
Done this 17th day of January, 2019.

ATTEST:

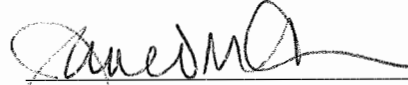
Brianna L. Lennon
Brianna L. Lennon
Clerk of the County Commission



Daniel K. Atwill
Presiding Commissioner



Fred J. Parry
District I Commissioner



Janet M. Thompson
District II Commissioner

Boone County Purchasing

Melinda Bobbitt, CPPO
Director of Purchasing



613 E. Ash Street, Room 110
Columbia, MO 65201
Phone: (573) 886-4391
Fax: (573) 886-4390

MEMORANDUM

TO: Boone County Commission
FROM: Melinda Bobbitt, CPPO, CPPB
DATE: January 16, 2019
RE: Cooperative Contract: AEPA-017-B – Photocopier and Maintenance for Prosecuting Attorney

The Boone County Prosecuting Attorney department requests permission to utilize the Association of Educational Purchasing Agencies (AEPA) cooperative contract AEPA-017-B with Sumnerone, Inc., d/b/a Image Technologies of Missouri of Columbia, Missouri to purchase a photocopier with maintenance.

Total cost of copier is \$6,517.00 and maintenance is 10,000 impressions / month minimum @ \$0.0054/impression. Invoices will be paid from department 1261 – Prosecuting Attorney, account 92000 – Replacement Office Equipment and 60050 – Equipment Service Contract. \$6,517 was budgeted for the copier and \$1,726 for maintenance.

Purchasing is seeking permission to dispose of their existing copier by trade.
Kyocera 5050 Copier, serial # PPK7907775, Asset tag 17873

Image Technologies will haul off and recycle at the time they install the new copier. The hard drive will be removed and left with our Information Technology department.

cc: Contract File
Bonnie Adkins, Prosecuting Attorney

BOONE COUNTY

REQUEST FOR DISPOSAL/TRANSFER OF COUNTY PROPERTY

DATE : 12/26/18

FIXED ASSET TAG NUMBER: 17873

RECEIVED

JAN 02 2019

DESCRIPTION: Kyocera 5050 Copier, serial #1B99840071

BOONE COUNTY

REQUESTED MEANS OF DISPOSAL: This copier is being traded in to Image Technologies. IT will meet with Image Technologies at time of installation of new copier and trade-in of this copier to remove the hard drive in 17873 (if there is one), and they will haul off the copier and recycle.

OTHER INFORMATION: We originally purchased a Gestetner 3235. It quit working and under the maintenance agreement the vendor traded this copier out for the Kyocera 5050.

CONDITION OF ASSET: High copy count.

REASON FOR DISPOSITION: Copier difficult to maintain and keep running

COUNTY / COURT IT DEPT. (circle one) DOES /DOES NOT (circle one) WISH TO TRANSFER THIS ITEM FOR ITS OWN USE (this item is applicable to computer equipment only)

DESIRED DATE FOR ASSET REMOVAL TO STORAGE: Image Technologies will pick up this copier in January

WAS ASSET PURCHASED WITH GRANT FUNDING? YES NO
IF YES, ATTACH DOCUMENTATION SHOWING FUNDING AGENCY'S PERMISSION TO DISPOSE OF ASSET.

DEPARTMENT: 2630 1261-Proc Atty SIGNATURE Bonnie Adams

AUDITOR

ORIGINAL PURCHASE DATE <u>9-9-1999</u>	RECEIPT INTO <u>N/A</u>	<u>NR</u>
ORIGINAL COST <u>\$8,327.15</u>	GRANT FUNDED (Y/N) _____	
ORIGINAL FUNDING SOURCE <u>2747</u>	GRANT NAME _____	
	% FUNDING _____	
	AGENCY _____	
ASSET GROUP <u>1601</u>	DOCUMENTATION ATTACHED (Y/N) _____	
	TRANSFER CONFIRMED _____	

COUNTY COMMISSION / COUNTY CLERK

APPROVED DISPOSAL METHOD:

____ TRANSFER DEPARTMENT NAME _____ NUMBER _____

LOCATION WITHIN DEPARTMENT _____

INDIVIDUAL _____

X TRADE _____ AUCTION _____ SEALED BIDS _____

____ OTHER EXPLAIN _____ \$0.00 trade-in value, but vendor will haul off and recycle _____

COMMISSION ORDER NUMBER 20-2019

DATE APPROVED 1-7-19

SIGNATURE [Signature]

**PURCHASE AGREEMENT
FOR
Photocopier and Maintenance for the Prosecuting Attorney**

THIS AGREEMENT dated the 17th day of January 2018⁹ is made between Boone County, Missouri, a political subdivision of the State of Missouri through the Boone County Commission, herein "County" and **Sumnerone, Inc., D/B/A Image Technologies of Missouri** herein "Vendor."

IN CONSIDERATION of the parties' performance of the respective obligations contained herein, the parties agree as follows:

1. **Contract Documents** - This agreement shall consist of this Purchase Agreement for a Photocopier with Maintenance, in compliance with all bid specifications and any addenda issued for the Association of Educational Purchasing Agencies (AEPA) contract **AEPA-017-B**, Insurance Requirements, and the Standard Terms and Conditions of Boone County, Missouri. All such documents shall constitute the contract documents which are incorporated herein by reference. Service or product data, specification and literature submitted with the bid response may be permanently maintained in the County Purchasing Office bid file for this bid if not attached. In the event of conflict between any of the foregoing documents, this Purchase Agreement, Association of Educational Purchasing Agencies (AEPA) contract AEPA-017-B, and the Standard Terms and Conditions of Boone County, Missouri shall prevail and control over the vendor's bid response.

2. **Purchase** - The County agrees to purchase from the Vendor and the Vendor agrees to supply the County with the following equipment and maintenance:

Prosecuting Attorney – Attn: Bonnie Adkins, 705 E. Walnut Street, Columbia, MO 65201. Phone: (573) 886-4112. E-mail: BADkins@boonecountymo.org.

Quantity: One (1) each

Copier: Kyocera TASKalfa 6002i - Monochrome Copier / Printer / Color Scanner

New Photocopier includes the following:

- | | |
|---|------------|
| • 60 pages per minute, black & white, MFP | \$4,242.00 |
| • 270 sheet Dual Scan Document Processor | \$834.00 |
| • 1,000 sheet stapler | \$714.00 |
| • Dual 1,500 sheet paper trays | \$640.00 |
| • Attachment Kit for DF-7110 | \$87.00 |

TOTAL: \$6,517.00

Pricing includes delivery, setup, connectivity, initial training, and on-going training and support.

Maintenance: shall be provided for the copier as follows:

- **Tier 2: 10,000 Impressions/month minimum @ \$0.0054/impression**
- Includes parts, labor, all preventative maintenance, and consumables (i.e. Toner and drum). Excludes paper and staples.
- 7 Year Replacement Guarantee on equipment
- Average response time is 4 hours or less

- Performance Guarantee with Loaner Program
- Factory parts re-stocked daily, factory trained technicians
- Non-stop continuous training
- Unlimited service calls

Maintenance shall begin upon installation of equipment. Maintenance agreement is customized to meet County needs and volume can be changed any time to Tier 1: no minimum, \$0.0059/impression or Tier 3: 25,000 Impressions/month minimum @ \$0.0049/impression. **Maintenance rates are firm for seven (7) years ending on December 31, 2025.**

Contractor's on-site maintenance for copier shall include preventative maintenance calls and all remedial service calls required by County and found to be necessary by the service representative to maintain the equipment in optimum operating condition (unlimited service calls). County expects repair response time to be four (4) business hours from the date and time a service call is placed. In the event a machine cannot be repaired within 48 hours of the first service request, a loaner machine of equal or higher level will be provided at no charge to the County. If the original equipment cannot be repaired to the satisfaction of the County, permanent replacement equipment with equal or greater specifications must be provided, at no cost to the County. The Contractor's responsibility for permanent replacement will be seven (7) fiscal years following the year equipment is installed and accepted by the County.

3. Delivery and Installation: Contractor agrees to deliver, setup, connect and provide training of copiers within 10 days after receipt of Purchase Order.

4. Trade-in Copier: Contractor shall remove the following trade-in copier with a \$0.00 value the same day the new copiers are installed and shall recycle equipment. Contractor agrees to remove the hard drive of the trade-in copier and leave with the Boone County Information Technology department.

Canon Kyocera 5050 Copier, serial # 1B99840071, fixed asset tag 17873.

5. Billing and Payment - All billing shall be invoiced to the Prosecuting Attorney department, 705 E. Walnut, Columbia, MO 65201. Billings may only include the prices listed in the vendor's bid response. No additional fees for paper work processing, labor, or taxes shall be included as additional charges in excess of the charges in the Vendor's bid response to the specifications. The County agrees to pay all Monthly Statements within thirty days of receipt. In the event of a billing dispute, the County reserves the right to withhold payment on the disputed amount; in the event the billing dispute is resolved in favor of the Vendor, the County agrees to pay interest at a rate of 9% per annum on disputed amounts withheld commencing from the last date that payment was due.

5. Binding Effect - This agreement shall be binding upon the parties hereto and their successors and assigns for so long as this agreement remains in full force and effect.

6. Termination - This agreement may be terminated by the County upon thirty days advance written notice for any of the following reasons or under any of the following circumstances:

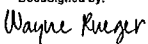
- a. The County may terminate this agreement due to material breach of any term or condition of this agreement; or

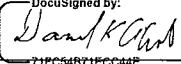
- b. The County may terminate this agreement if in the opinion of the Boone County Commission, delivery of products are delayed or products delivered are not in conformity with bidding specifications or variances authorized by County; or
- c. If appropriations are not made available and budgeted for any calendar year.

IN WITNESS WHEREOF the parties through their duly authorized representatives have executed this agreement on the day and year first above written.

**SUMNERONE, INC.
D/B/A IMAGE TECHNOLOGIES OF MISSOURI**

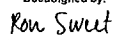
BOONE COUNTY, MISSOURI

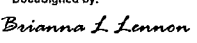
by DocuSigned by:

0AC72AFCDCDF84F9...
 title VP

by: Boone County Commission
DocuSigned by:

71PC54B71ECC44E...
 Daniel K. Atwill, Presiding Commissioner

APPROVED AS TO FORM:

ATTEST:

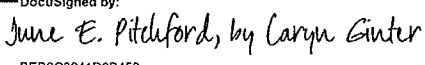
DocuSigned by:

66E0A8BDD8A0445...
 County Counselor

DocuSigned by:

7DB2DA988BFB6405...
 County Clerk

AUDITOR CERTIFICATION

In accordance with RSMo 50.660, I hereby certify that a sufficient unencumbered appropriation balance exists and is available to satisfy the obligation(s) arising from this contract. (Note: Certification of this contract is not required if the terms of this contract do not create a measurable county obligation at this time.)

Copier: 1261 / 92000 / \$6,517
Maintenance: 1261 / 60050 /

DocuSigned by:

BEB2C3241D8B450...
 Signature

10,000 Impressions/month minimum @ \$0.0054/impression
 1/7/2019
 Date

Appropriation Account

STANDARD CONTRACT TERMS AND CONDITIONS - BOONE COUNTY, MISSOURI

1. Contractor shall comply with all applicable federal, state, and local laws and failure to do so, in County's sole discretion, shall give County the right to terminate this Contract.
2. Prices shall include all charges for packing, delivery, installation, etc., (unless otherwise specified) to the Boone County Department.
3. The Boone County Commission has the right to accept or reject any part or parts of all bids, to waive technicalities, and to accept the offer the County Commission considers the most advantageous to the County. Boone County reserves the right to award this bid on an item-by-item basis, or an "all or none" basis, whichever is in the best interest of the County. The Purchasing Director reserves the right, when only one bid has been received by the bid closing date, to delay the opening of bids to another date and time in order to revise specifications and/or establish further competition for the commodity or service required. The one (1) bid received will be retained unopened until the new Closing date, or at request of bidder, returned unopened for re-submittal at the new date and time of bid closing.
4. When products or materials of any particular producer or manufacturer are mentioned in our contracts, such products or materials are intended to be descriptive of type or quality and not restricted to those mentioned.
5. Do not include Federal Excise Tax or Sales and Use Taxes in billing, as law exempts the County from them.
6. The delivery date shall be stated in definite terms.
7. The County Commission reserves the right to cancel all or any part of orders if delivery is not made or work is not started as guaranteed. In case of delay, the Contractor must notify the Purchasing Department.
8. In case of default by the Contractor, the County of Boone will procure the articles or services from other sources and hold the Contractor responsible for any excess cost occasioned thereby.
9. Failure to deliver as guaranteed may disqualify Contractor from future bidding.
10. Prices must be as stated in units of quantity specified and must be firm.
11. The County of Boone, Missouri expressly denies responsibility for, or ownership of any item purchased until same is delivered to the County and is accepted by the County.
12. The County reserves the right to award to one or multiple respondents. The County also reserves the right to not award any item or group of items if the services can be obtained from a state or other governmental entities contract under more favorable terms. The resulting contract will be considered "Non-Exclusive". The County reserves the right to purchase advertising from other vendors.

13. The County, from time to time, uses federal grant funds for the procurement of goods and services. Accordingly, the provider of goods and/or services shall comply with federal laws, rules and regulations applicable to the funds used by the County for said procurement, and contract clauses required by the federal government in such circumstances are incorporated herein by reference. These clauses can generally be found in the Federal Transit Administration's Best Practices Procurement Manual – Appendix A. Any questions regarding the applicability of federal clauses to a particular bid should be directed to the Purchasing Department prior to bid opening.
14. In the event of a discrepancy between a unit price and an extended line item price, the unit price shall govern.
15. Should an audit of Contractor's invoices during the term of the Agreement, and any renewals thereof, indicate that the County has remitted payment on invoices that constitute an over-charging to the County above the pricing terms agreed to herein, the Contractor shall issue a refund check to the County for any over-charges within 30-days of being notified of the same.
16. **For all titled vehicles and equipment, the dealer must use the actual delivery date to the County** on all transfer documents including the Certificate of Origin (COO,) Manufacturer's Statement of Origin (MSO,) Bill of Sale (BOS,) and Application for Title.
17. **Equipment and serial and model numbers** - The contractor is strongly encouraged to include equipment serial and model numbers for all amounts invoiced to the County. If equipment serial and model numbers are not provided on the face of the invoice, such information may be required by the County before issuing payment.

Insurance Requirements: The contractor shall not commence work under this contract until they have obtained all insurance required under this paragraph and the Certificate of Insurance has been approved by the County, nor shall the contractor allow any subcontractor to commence work on their subcontract until all similar insurance required of subcontractor has been so obtained and approved. All policies shall be in amounts, form and companies satisfactory to the County which must carry an A-6 or better rating as listed in the A.M. Best or equivalent rating guide. Insurance limits indicated below may be lowered at the discretion of the County.

Employers Liability and Workers Compensation Insurance: The contractor shall take out and maintain during the life of the contract, **Employers Liability and Workers Compensation Insurance** for all of its employees employed at the site of work, and in case any work is sublet, the contractor shall require the subcontractor similarly to provide Workers Compensation Insurance for all of the latter's employees unless such employees are covered by the protection afforded by the Contractor. Workers Compensation coverage shall meet Missouri statutory limits. Employers Liability limits shall be \$500,000.00 each employee, \$500,000.00 each accident, and \$500,000.00 policy limit. In case any class of employees engaged in hazardous work under the contract at the site of the work is not protected under the Workers Compensation Statute, the contractor shall provide and shall cause each subcontractor to provide Employers Liability Insurance for the protection of their employees not otherwise protected.

Commercial General Liability Insurance: The contractor shall take out and maintain during the life of this contract, such commercial general liability insurance as shall protect it and any subcontractor performing work covered by this contract, from claims for damages for personal & advertising injury, bodily injury including accidental death, as well as from claims for property damages, which may arise from operations under this contract, whether such operations be by themselves or for any subcontractor or by anyone directly or indirectly employed by them. The amounts of insurance shall be not less than \$1,000,000.00 per occurrence/\$2,000,000 aggregate covering both bodily injury and property damage, including accidental death. If the Contract involves any underground/digging operations, the general liability certificate shall include X, C, and U (Explosion, Collapse, and Underground) coverage. If providing Commercial General Liability Insurance, then the Proof of Coverage of Insurance shall also be included.

The contractor may satisfy the minimum liability limits required for Commercial General Liability or Business Auto Liability under an Umbrella or Excess Liability policy. There is no minimum per occurrence limit of liability under the umbrella or Excess Liability; however, the Annual Aggregate limit shall not be less than the highest "Each Occurrence" limit for either Commercial General Liability or Business Auto Liability. **The contractor agrees to include the County as an Additional Insured on the umbrella or Excess Liability, unless the Certificate of Insurance state the Umbrella or Excess Liability provides coverage on a "Follow-Form" basis.**

Business Automobile Liability: The contractor shall maintain during the life of the contract, automobile liability insurance in the amount of not less than \$2,000,000.00 combined single limit for any one occurrence, covering both bodily injury, including accidental death, and property damage, to protect themselves from any and all claims arising from the use of the contractor's own automobiles, teams and trucks; hired automobiles, teams and trucks; non-owned and both on and off the site of work.

Subcontractors: The contractor shall cause each subcontractor to purchase and maintain insurance of the types and amounts specified herein. Limits of such coverage may be reduced only upon written agreement of County. The contractor shall provide to the County copies of certificates of insurance evidencing

coverage for each subcontractor. The subcontractor's commercial general liability and business automobile liability insurance shall name the County as Additional Insured and have the Waiver of Subrogation endorsements added.

Proof of Carriage of Insurance: The contractor shall furnish the County with Certificate(s) of Insurance which name the County as additional insured in an amount as required in the contract. The Certificate of Insurance shall provide that there will be no cancellation, non-renewal or reduction of coverage without 30 calendar days prior written notice to the County. In addition, such insurance shall be on an occurrence basis and shall remain in effect until such time as the County has made final acceptance of the services provided.

INDEMNITY AGREEMENT: To the fullest extent permitted by law, the contractor shall indemnify, hold harmless and defend the County, its directors, officers, agents, and employees from and against all claims, damages, losses and expenses (including but not limited to attorney's fees) arising by reason of any act or failure to act, negligent or otherwise, of the contractor, of any subcontractor (meaning anyone, including but not limited to consultants having a contract with contractor or a subcontract for part of the services), of anyone directly or indirectly employed by contractor or by any subcontractor, or of anyone for whose acts the contractor or its subcontractor may be liable, in connection with providing these services. This provision does not, however, require the contractor to indemnify, hold harmless, or defend the County of Boone from its own negligence.

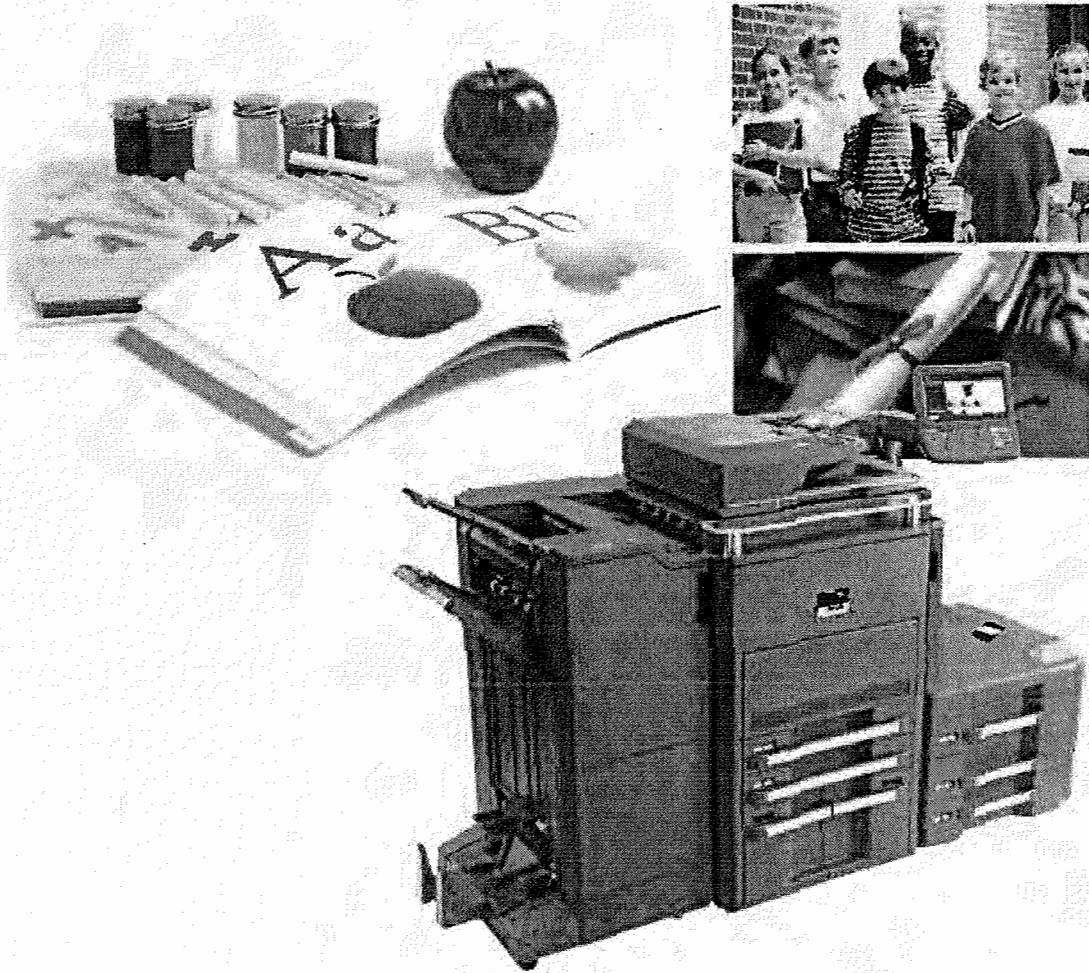
Nothing in these requirements shall be construed as a waiver of any governmental immunity of the County, its officials nor any of its employees in the course of their official duties.

Failure to maintain the required insurance in force may be cause for contract termination. In the event the Agency/Service fails to maintain and keep in force the required insurance or to obtain coverage from its subcontractors, the County shall have the right to cancel and terminate the contract without notice.

Certificate Holder address:

County of Boone, Missouri
C/O Purchasing Department
613 E. Ash Street
Columbia, MO 65201

AEPA | Copiers and Printing Equipment



Association of Educational
Publishers and Printers

AEPA

Contract Number AEPA IFB #017-B



KYOCERA Document Solutions America, Inc.
National Accounts



AEPA | Participation Agencies and States

Association of Educational
Purchasing Agencies

The Association of Educational Purchasing Agencies' (AEPA) is a nationwide group of nonprofit educational organizations working collaboratively to save school districts time and money.

AEPA has more than \$330 million in annual protected purchases. We are currently 24 members strong, representing schools serving more than 25 million students. Together we have hundreds of years of public sector purchasing experience.

Program Advantages:

- Time savings with lowest national pricing available
- Attract and leverage national vendors
- Detailed and complete bid process through nationally experienced participants
- Volume contracts based on 24 member participation
- Avoid duplication and expense of bid process

Our mission is to cooperatively serve our agency memberships through a continuous effort to explore and solve present and future purchasing needs. Our goals include working on your behalf to secure multi-state volume purchasing contracts that have benefits that are measurable, cost-effective and continuously exceed our membership's expectations.

Our current membership consists of the following states:

California	Massachusetts	Ohio
Colorado	Michigan	Oregon
Connecticut	Minnesota	Pennsylvania
Florida	Missouri	Texas
Iowa	Montana	Virginia
Indiana	North Dakota	Washington
Kansas	Nebraska	West Virginia
Kentucky	New Jersey	Wisconsin
	New Mexico	Wyoming



Association of Educational
Purchasing Agencies



Panhandle Area Educational Consortium
Florida, Alabama, Georgia



Cooperating School Districts
Missouri, Louisiana, Arkansas, Illinois



Colorado BOCES Association
Colorado



Capitol Region Education Council
Connecticut, Maine, New Hampshire, Rhode Island, Vermont



Fairfax County Public Schools
Virginia



Northeast Wyoming BOCES
Wyoming, South Dakota



Wilson Education Center
Indiana



The Education Cooperative
Massachusetts



CESA Purchasing Org.
Wisconsin



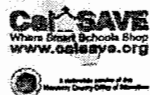
Cooperative Educational Services
New Mexico



Green River Regional Educational Cooperative
Kentucky, Tennessee, Alabama, Georgia,
Louisiana, North Carolina



Middlesex Regional Educational Services
New Jersey



Cal Save - Monterey County Office of Education
California, Arizona, Nevada



Iowa Educators Consortium
Iowa



Southeast Kansas Education Service Center
Kansas, Oklahoma



Minnesota Services Cooperatives
Minnesota, South Dakota



Montana Cooperative Services LLC

Montana Cooperative Services LLC
Montana, Idaho



Nebraska Cooperative Purchasing
Nebraska



Keystone Purchasing Network
Pennsylvania, Delaware, Maryland, New Hampshire,
New York, Rhode Island, West Virginia



Educational Services Commission of New Jersey
New Jersey



North Dakota Educators Service Cooperative
North Dakota



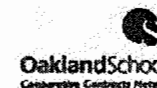
Ohio Council of Educational Purchasing Consortia
Ohio



Inter-Mountain Education Service District
Oregon



TexBuy
Texas



Oakland Schools
Michigan



King County Director's Association
Washington, Alaska, Idaho



Regional Education Service Agencies
West Virginia

Kyocera National Accounts In Partnership with
the Association of Educational Purchasing Agencies
Contract Number: AEPA013.1-A

GENERAL CONTRACT INFORMATION

Ordering Procedure

Individual State Cooperative terms and conditions related to ordering may vary from state to state. Please refer to the terms and conditions as listed in the bid offering or contact your local National Account Manager for assistance. The bid offering terms and conditions are available at the AEPA website at <http://aepa-coop.org/>.

When a member agency selects product from Kyocera using the AEPA contract, the member agency issues a purchase order on a direct basis to Kyocera to the address below:

Ordering Address

KYOCERA Document Solutions America, Inc.
Attn.: National Accounts
c/o Local Authorized Dealer (insert name)
225 Sand Road, PO Box 40008
Fairfield, NJ 07004-0008
Telephone: (973) 808-8444
e-mail: natorders@da.kyocera.com • Fax: (973) 882-4411
DUNS #06-446-5503

Payment Address

KYOCERA Document Solutions America, Inc.
As Shown on Invoice

This process is to be followed with the following exceptions:

- Indiana - All Indiana orders are to be placed using the IAESC Web Based ordering system.
- New Mexico - All New Mexico orders are to be placed through the CES the governing Cooperative for New Mexico.

For assistance on ordering in Indiana or New Mexico, please contact the National Account Manager for each of these states or the lead National Account Manager for the AEPA contract Philip Borchardt.

Payment Terms

Net 30 days. All prices shown herein are net (discount deducted).

Federal I.D. No.	DUNS#	Business Size
TIN: 95-2819506	06-446-5503	Large

Limited Warranty

Kyocera warrants that all equipment delivered under this contract shall conform to the specification of this contract. All equipment will carry a 12-month manufacturers warranty against any defects in material and workmanship for a period of one year from the date of installation by Kyocera or an Authorized Kyocera Dealer except drums which are limited to proper performance at the time of installation. In the event this product is found to be defective within the warranty period, Kyocera obligation and your exclusive remedy shall be replacement of any defective parts. These warranties would be void if the equipment is not operated properly or misused. Drum warranties are limited to electrical functioning of the drum and are void if misused or physically damaged by the operator.

Service

The AEPA contract calls for service billing to be done on a "Cost Per Copy" (CPC) basis by the Authorized servicing dealer. A service & supply program will be set up at time of installation. This service will be on-site and will include all parts & labor, all preventative maintenance, and consumables except paper and staples.

Lease Plans

Lease Plans are available upon request. Please contact your National Account Manager for more information.

Delivery

It is desired that delivery be made within thirty-days (30) of receipt of the purchase order.

Defective Goods

Kyocera agrees to pay for return shipment on goods that arrive in a defective or inoperable condition. Kyocera agrees to arrange for return shipment of damaged goods.

For more information please contact
the Kyocera Account Manager responsible
for this contract nationwide, Philip Borchardt
by calling: (612) 670-3889,
or e-mail philip.borchardt@da.kyocera.com



Kyocera is not responsible for typographical errors.
Designs and specifications subject to change without notice.
Photos are for illustration only, and may contain optional accessories not included in specific product configurations.
©2018 KYOCERA Document Solutions America, Inc. All Rights Reserved

Sample Purchase Order – Outright Purchase

The following is an example of an Outright Purchase Order.

Please pay particular attention to the areas marked A-I.

Incorrect information in these areas will require modification from the issuing office.

1. AEPA CONTRACT NO. AEPA IFB #017B A		2. REQUISITION NO.		3. DATE OF ORDER DD/MM/YY		4. PURCHASE ORDER NUMBER AEPA-XXXXX-XXXXX		5. PRIORITY	
6. ISSUED BY AGENCY NAME ATTN, BUYERS NAME ADDRESS CITY, STATE ZIP				7. ADMINISTERED BY AGENCY NAME ADDRESS CITY, STATE ZIP				8. DELIVERY FOB (X) DESTINATION () OTHER (See Schedule)	
9. CONTRACTOR Vendor Id: CAGE CODE NAME AND ADDRESS KYOCERA Document Solutions America, Inc. ATTN: National Accounts C/O KYOCERA AUTHORIZED DEALER NAME 225 SAND ROAD, P.O. BOX 40008 FAIRFIELD, NJ 07004-008 B				10. DELIVERY TO FOB POINT BY (date)		11. MARK IF BUSINESS IS () SMALL () SMALL DIS-ADVANTAGED () WOMEN OWNED () OTHER		12. DISCOUNT AND/OR NET PAYMENT TERMS Net 30 Days C	
13. MAIL INVOICES TO:				14. CONSIGNEE AND DESTINATION (SHIP TO) AGENCY NAME ADDRESS ATTN: CITY, STATE ZIP				15. PAYMENT WILL BE MADE BY: AGENCY NAME ADDRESS ATTN: CITY, STATE ZIP	
16. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE See Schedule									
17. ITEM NO.	18. ARTICLES OR SERVICES	19. QTY.	20. UNIT	21. UNIT PRICE	22. EXTENDED AMOUNT				
0001	FS-6530MFP 30 CPM Monochrome MFP D	01	Each	\$ x,xxx.xx	\$ x,xxx.xx				
				E	F	G			
If quantity accepted by the Agency is same as quantity ordered, indicated by x. If different, enter actual quantity accepted below quantity ordered and encircle				24. ORDERED BY Signature _____ I Name _____ Title: _____		25. TOTAL H \$ xxxxx.xx			
26. QUANTITY IN COLUMN 20 HAS BEEN () INSPECTED () RECEIVED () ACCEPTED AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED				27. PAYMENT () COMPLETE () PARTIAL () FINAL		28. INITIALS			
DATE _____ SIGNATURE OF AUTHORIZED GOVERNMENT REP _____				30. I certify this account is correct and proper for payment		31. PAID BY		29. AMT VERIFIED FOR CHECK NUMBER	
DATE _____ SIGNATURE OF AUTHORIZED GOVERNMENT REP _____				32. BILL OF LADING NO.					
33. REC'D AT		34. REC'D BY		35. DATE REC'D					

A. Contract Number - Must Have AEPA Contract Number AEPA IFB #017B

B. Vendor Address - KYOCERA Document Solutions America, Inc.
Attn: National Accounts
c/o Local Authorized Kyocera Dealer (Insert Name)
225 Sand Road, P.O. Box 40008
Fairfield, New Jersey 07004-0008
e-mail: natorders@da.kyocera.com

C. Payment Terms - Net 30 Days

D. Products - Descriptions of the items ordered by the user

E. Quantity - The quantity ordered of the unit

F. Price - The price of one unit to be purchased

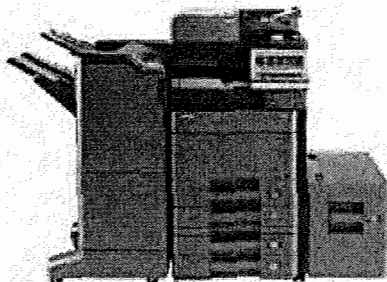
G. Total Price Per Item - The total amount for that item based on the unit price (Quantity Ordered x Unit Price)

H. Total Price of Purchase Order - The total dollar amount obligated for the purchase order

I. Signature - Be sure to sign the purchase order. Must be signed by an authorized Contracting/Ordering Officer



Association of Public Administrators



The TASKalfa 6002i is a best-in-class Black and White MFP that combines print, copy, and color scan functionality into one **powerful platform**. To ensure that your organization runs at peak efficiency, the TASKalfa 6002i offers an unmatched array of standard features, **professional finishing options**, and host of customizable business applications that further streamline workflow. Add to that Kyocera's **award-winning ultra-reliability** and unique **long-life technology**, and proven leadership in technology innovation, and the TASKalfa 6002i will transform end-to-end document processes... and drive bottomline business growth.

Includes Delivery and Installation. Lease Plans are available. Please contact your National Account Manager for details.



TASKalfa 6002i

MONOCHROME MFP

SPECIFICATIONS AT A GLANCE

- Speed: 63 Pages Per Minute
- Functions: Standard Network Print, Copy, Color Scan & Document Box, Optional Fax/Network Fax & Dual Fax
- Max Monthly Duty Cycle: 225,000 Pages Per Month
- Resolution: 600 x 600 dpi
- Standard Paper Supply: Dual 500 Sheet Trays, 150 Sheet MPT
- Max Paper Size: 12" x 18"
- Max Paper Weight: 166 lb Index
- Original Size: 11" x 17"
- Duplexing: Standard Embedded Duplex
- Network Connectivity: 10/100/1000BaseTX; High Speed USB 2.0
- PDL: PRESCRIBE, PCL6 (PCL-XL / PCL5), KPDL3 (PS3), XPS, OPEN XPS; Optional (UG-34): IBM ProPrinter, Line Printer, LQ-850
- Fax Modem Speed (Optional): 33.3 kbps
- Fax Memory (Optional): 170 MB Standard



■ TASKalfa 6002i SOLUTIONS

Model	Description	AEPA Price
TASKalfa 6002i	60 PPM A3 B&W MFP	\$ 4,242.00
Accessories		
DP-7100	140 Sheet Reversing Automatic Document Processor	658.00
DP-7110	270 Sheet Dual Scan Document Processor	834.00
DF-7100	600 Sheet Internal Finisher	647.00
DF-7110	4,000 Sheet Staple Finisher (Requires AK-7100)	1,159.00
DF-7120	1,000 Sheet Staple Finisher (Requires AK-7100)	714.00
PF-7100	Dual 500 Sheet Paper Trays	598.00
PF-7110	Dual 1,500 Sheet Paper Trays	640.00
PF-7120	3,000 Sheet Side Large Capacity Tray - Letter	658.00
PH-7A	Punch Unit for DF-7120/7110	311.00
PH-7100	Hole Punch Unit for DF-7100	311.00
BF-730	Booklet and Tri Folding Unit for DF-790(C)	696.00
MT-730(B)	7 Bin Mailbox for 4,000 Sheet Finisher	464.00
JS-7100	Job Separator	88.00
Fax System 12	Fax Board	630.00
Keyboard Holder 10	Keyboard Tray Kit	62.00
Internet Fax (A)	Internet Fax Kit [requires Fax System (W)B]	164.00
Data Security (E)	Hard Drive Encryption/Overwrite Kit	326.00
Banner Guide(A)	MPT Guide attachment to assist the feeding of banner paper.	167.00
Scan Extension Kit(A)	Searchable PDF Kit	328.00
AK-7100	Attachment kit for DF-7120 / DF-7110	87.00
UG-33	Upgrade Kit for Thin Print Support	78.00
UG-34	Optional Printer Emulation for IBM Proprinter, Epson LQ-850, Diabro 630	305.00
Card Reader Holder 11	Card Reader Holder	35.00
IB-50	Gigabit EtherNet Board for Dual NIC	194.00
IB-51	Wireless LAN NIC	262.00
MM-16-12B	Additional Fax Memory Board	109.00
DT-730(B)	Original Hard Copy Holder	24.00
Platen Cover Type E	Platen Cover	63.00
STAND	Copier Cabinet Stand	194.00
NK-7110	Numeric Keypad	65.00
Surge Protector-MX (15A)	15 Amp Surge Protector	122.00

Copier Maintenance Pricing pages 41-51.

MAINTENANCE PRICING

TASKalfa 4012i COPY CHARGE FOR SERVICE AND SUPPLIES

TASKalfa 4012i FULL SERVICE MAINTENANCE & SUPPLY COST PER IMPRESSION	ZONE 1 LOCAL FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)	ZONE 2 25 - 50 MILES FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)	ZONE 3 50 - 75 MILES FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)	ZONE 4 GREATER THAN 75 MI. FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)
Tier 1: No Minimum	\$ 0.0085	\$ 0.0085	\$ 0.0090	\$ 0.0095
Tier 2: 5,000 Impressions/Mo. Min.	\$ 0.0082	\$ 0.0082	\$ 0.0087	\$ 0.0092
Tier 3: 10,000 Impressions/Mo. Min.	\$ 0.0079	\$ 0.0079	\$ 0.0083	\$ 0.0087

TASKalfa 4002i COPY CHARGE FOR SERVICE AND SUPPLIES

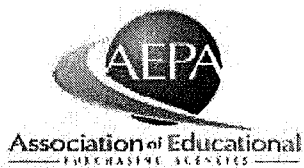
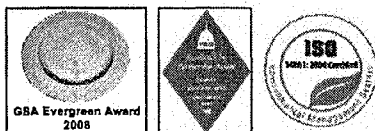
TASKalfa 4002i FULL SERVICE MAINTENANCE & SUPPLY COST PER IMPRESSION	ZONE 1 LOCAL FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)	ZONE 2 25 - 50 MILES FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)	ZONE 3 50 - 75 MILES FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)	ZONE 4 GREATER THAN 75 MI. FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)
Tier 1: No Minimum	\$ 0.0085	\$ 0.0085	\$ 0.0090	\$ 0.0095
Tier 2: 5,000 Impressions/Mo. Min.	\$ 0.0082	\$ 0.0082	\$ 0.0087	\$ 0.0092
Tier 3: 10,000 Impressions/Mo. Min.	\$ 0.0079	\$ 0.0079	\$ 0.0083	\$ 0.0087

TASKalfa 5002i COPY CHARGE FOR SERVICE AND SUPPLIES

TASKalfa 5002i FULL SERVICE MAINTENANCE & SUPPLY COST PER IMPRESSION	ZONE 1 LOCAL FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)	ZONE 2 25 - 50 MILES FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)	ZONE 3 50 - 75 MILES FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)	ZONE 4 GREATER THAN 75 MI. FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)
Tier 1: No Minimum	\$ 0.0070	\$ 0.0070	\$ 0.0075	\$ 0.0080
Tier 2: 8,000 Impressions/Mo. Min.	\$ 0.0066	\$ 0.0066	\$ 0.0070	\$ 0.0074
Tier 3: 15,000 Impressions/Mo. Min.	\$ 0.0062	\$ 0.0062	\$ 0.0065	\$ 0.0068

TASKalfa 6002i COPY CHARGE FOR SERVICE AND SUPPLIES

TASKalfa 6002i FULL SERVICE MAINTENANCE & SUPPLY COST PER IMPRESSION	ZONE 1 LOCAL FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)	ZONE 2 25 - 50 MILES FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)	ZONE 3 50 - 75 MILES FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)	ZONE 4 GREATER THAN 75 MI. FULL SERVICE MAINT. & SUPPLY COST PER IMPRESSION (CPI)
Tier 1: No Minimum	\$ 0.0059	\$ 0.0059	\$ 0.0064	\$ 0.0069
Tier 2: 10,000 Impressions/Mo. Min.	\$ 0.0054	\$ 0.0054	\$ 0.0058	\$ 0.0062
Tier 3: 25,000 Impressions/Mo. Min.	\$ 0.0049	\$ 0.0049	\$ 0.0052	\$ 0.0055



AEPA

Contract Number AEPA IFB #017B

KYOCERA Document Solutions America, Inc.
National Accounts



KYOCERA Document Solutions America, Inc.

225 SAND ROAD
PO BOX 40008
FAIRFIELD, NJ 07004-0008
Tel: (973) 808-8444
Fax: (973) 882-4411



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
2/16/2018

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER J.W. Terrill, a Marsh & McLennan Agency LLC Co. 825 Maryville Centre Drive Suite 200 Chesterfield MO 63017	CONTACT NAME: Shelley Thompson PHONE (A/C, No, Ext): 314-594-2632 FAX (A/C, No): 888-307-1561 E-MAIL ADDRESS: shelley.thompson@jwterrill.com
INSURER(S) AFFORDING COVERAGE	
INSURER A : Atlantic Specialty Insurance Company NAIC # 27154	
INSURER B :	
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** 1160546342 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input checked="" type="checkbox"/> LOC OTHER:			7110150550002	3/1/2018	3/1/2018	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 500,000 MED EXP (Any one person) \$ 10,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000 \$
A	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS			7110150550002	3/1/2018	3/1/2018	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
A	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input checked="" type="checkbox"/> RETENTION \$ 0			7110150550002	3/1/2018	3/1/2018	EACH OCCURRENCE \$ 10,000,000 AGGREGATE \$ 10,000,000 \$
A	<input checked="" type="checkbox"/> WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below			4060436990002	3/1/2018	3/1/2018	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
 SCHEDULE OF NAMED INSURED(S): Sumner Group, Inc.; Sumner One, Inc. dba Copying Concepts Office Systems; Datamax Office Systems; Unisource Document Products; Datamax Office Systems of Kansas City; Western Imaging; Corporate Business Systems
 Re: Copier Maintenance
 Boone County is included as Additional Insured(s) for General Liability, Automobile Liability, and Umbrella Liability with respect to work performed by the Named Insured, if required by written contract.
 A waiver of subrogation is granted for General Liability and Worker's Compensation coverages in favor of Boone County Purchasing, where permitted by law and if required by written contract.

CERTIFICATE HOLDER Boone County Attn: Melinda Bobbitt Boone County Annex Building 613 E Ash St. Room 109 Columbia MO 65201 USA	CANCELLATION SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE
---	--

Company ID Number: 133457

INFORMATION REQUIRED FOR THE E-VERIFY PROGRAM	
Information relating to your Company:	
Company Name:	<u>Sumner Group, Inc.</u>
Company Facility Address:	<u>2121 Hampton Avenue</u> <u>St Louis, MO 63139</u>
Company Alternate Address:	_____ _____
County or Parish:	<u>SAINT LOUIS CITY</u>
Employer Identification Number:	<u>431332770</u>
North American Industry Classification Systems Code:	<u>424</u>
Parent Company:	<u>Sumner Group, Inc.</u>
Number of Employees:	<u>100 to 499</u>
Number of Sites Verified for:	<u>1</u>
Are you verifying for more than 1 site? If yes, please provide the number of sites verified for in each State.	
• MISSOURI 1 site(s)	

Information relating to the Program Administrator(s) for your Company on policy questions or operational problems:

Name:	Jennifer M Johnson	Fax Number:	(314) 633 - 8005
Telephone Number:	(314) 633 - 8041		
E-mail Address:	jjohnson@sumner-group.com		
Name:	Terri L Hackmeyer	Fax Number:	(314) 633 - 8005
Telephone Number:	(314) 633 - 8042		
E-mail Address:	thackmeyer@sumner-group.com		
Name:	Robert N Brueggeman	Fax Number:	(314) 633 - 8005
Telephone Number:	(314) 633 - 8040		
E-mail Address:	bbrueggeman@sumner-group.com		
Name:	Pamela M Barton		

Company ID Number: 133457

Telephone Number:	(314) 633 - 8043	Fax Number:	(314) 633 - 8005
E-mail Address:	pbaron@sumner-group.com		

CERTIFIED COPY OF ORDER

STATE OF MISSOURI

January Session of the January Adjourned

Term. 20 19

County of Boone

} ea.

In the County Commission of said county, on the

17th

day of

January

20 19

the following, among other proceedings, were had, viz:

Now on this day, the County Commission of the County of Boone does hereby grant a variance from the standard public street width requirement of Boone County Regulations, Chapter II; Road, Bridge, and Right-of-Way Regulations, Appendix B-1, Standard Drawing 110.02, to allow a 28-foot wide, no-curb and gutter street pavement width for the proposed Cresskill Drive extension within the A-2P development known as The Estates, with the condition that No Parking signs will be placed on both sides of the street. The variance approval is based on consideration of the following items:

- The proposed low density, longer street frontage, and larger lot development is similar to the conditions currently being discussed as part of the subdivision regulations update that would be necessary for a reduced width, "Agricultural District Roads" street standard to be created.
- County Commission Order 50-2006 approved a 28-foot wide, curb and gutter street width variance for the cul-de-sac streets in the adjacent Heatherhill Estates subdivision (formally known as Providence Heights).

Done this 17th day of January, 2019.

ATTEST:

Brianna L. Lennon
 Brianna L. Lennon
 Clerk of the County Commission

Daniel K. Atwill
 Daniel K. Atwill
 Presiding Commissioner

Fred J. Parry
 Fred J. Parry
 District I Commissioner

Janet M. Thompson
 Janet M. Thompson
 District II Commissioner

22-2019

CERTIFIED COPY OF ORDER

STATE OF MISSOURI

January Session of the January Adjourned

Term. 20 19

County of Boone

} ea.

In the County Commission of said county, on the 17th day of January 20 19

the following, among other proceedings, were had, viz:

Now on this day, the County Commission of the County of Boone does hereby approve the attached 2019 Annual Consultant Service Agreements for Professional Services with the following:

- A Civil Group
- Allstate Consultants
- CFS Engineers
- CM Engineering, Inc
- Crockett Engineering Consultants
- Engineering Surveys and Services, LLC
- Klingner & Associates, P.C.
- Malicoat-Winslow Engineers, P.C.
- McClure Engineering Co

The terms of the Agreements are stipulated in the attached Agreements. It is further ordered the Presiding Commissioner is hereby authorized to sign said General Consultant Services Agreements.

Done this 17th day of January, 2019.

ATTEST:

Brianna L. Lennon
 Brianna L. Lennon
 Clerk of the County Commission

Daniel K. Atwill
 Daniel K. Atwill
 Presiding Commissioner

Fred J. Parry
 Fred J. Parry
 District I Commissioner

Janet M. Thompson
 Janet M. Thompson
 District II Commissioner

GENERAL CONSULTANT SERVICES AGREEMENT

THIS AGREEMENT dated this 17th day of January, 2018, ~~2019~~ by and between Boone County, Missouri, a first class county and political subdivision of the state of Missouri through its County Commission, (herein "Owner") and A Civil Group (herein "Consultant").

IN CONSIDERATION OF the performance of the services rendered under this Agreement and payment for such services, the parties agree to the following:

1. **Agreement duration** – This contract shall be in effect beginning January 1, 2019 or the date of full execution; which ever is later and run through the calendar year ending on December 31, 2019. This agreement may be terminated in accordance with the terms and conditions set forth in this agreement.

2. **Services** - As authorized by the Owner in writing, the Consultant shall provide the Owner all engineering, surveying, and other professional services for the benefit of the Owner as prescribed by the Owner based upon requests for proposals for projects assigned during the term of this agreement and the Consultant shall provide the Owner, as applicable, with the services, reports, studies, surveys, plans, specifications, and other work required by the Owner's request for proposal. Consultant agrees to provide all such services in a timely manner as established by the Owner in writing for each assigned project, or in the absence of the designation, within a reasonable time after receipt of Owner directives. Consultant agrees to provide services by and through qualified personnel under standards and conditions generally accepted by professionals in the field or occupations for which services are provided. Services shall be provided based only upon requests for proposals provided to the Consultant by the Owner or Owner's representative and to which the Consultant prepares and submits a written proposal for services which is approved by the Owner in writing. No work shall be performed nor shall compensation be paid for Consultant work performed without an Owner approved written proposal for professional services. Proposals for services shall be in written form, as required by the request for proposal, and shall be specifically responsive to the criteria provided by the Owner in its request for proposal. All work performed by the Consultant, based upon Owner approved proposals submitted by the Consultant, shall be subject to the terms and conditions of this agreement unless otherwise specifically agreed upon by the Owner and Consultant in writing. All proposals for work submitted by the Consultant to the Owner for work shall at a minimum contain the following:

2.1 **Scope of Services** - Each proposal for services shall contain a detailed description of work to be performed by the Consultant. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to the request with the same or greater level of specificity required by the request for proposal. The Consultant shall specifically identify services which are included as basic services and those services which are excluded from basic services in the proposal. Services which the Consultant does not identify as excluded from basic services under the proposal and which are necessary for successful completion of the work in the judgment of the Owner shall be presumed to be a part of basic services under the proposal. If a request for proposal requires the Consultant to provide optional services, the Consultant's proposal shall respond to the options requested, or provide

reasons why the Consultant cannot provide or respond to the request for optional services.

2.2 Time for Completion - Each proposal for services shall contain a detailed description of the estimated time to complete each task or item of work to be performed by the Consultant under the proposal. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to any request for estimated or maximum completion times for work with the same or greater level of specificity required by the request for proposal.

2.3 Compensation - Each proposal for services shall state the basis of compensation on either: (1) an hourly fee plus expense basis with a statement of a maximum compensation to be charged, or, (2) a lump sum payment of compensation for all work to be performed, or, (3) a payment based upon unit prices. Proposals for compensation for an hourly fee plus expense basis shall provide detailed time and expense estimates to support a maximum contract amount to be charged and shall be consistent with the hourly rates, unit prices and reimbursement rates made a part of this agreement by reference in paragraph two (2) below. When the Owner or Owner's representative requests the Consultant to provide work on an hourly fee plus expense basis, the Consultant's proposal shall be responsive to the request and shall not propose payment on another basis unless otherwise authorized. Unit price proposals shall identify and estimate the quantity of units as a part of the proposal when they can be identified and estimated, or as necessary in response to a particular request for proposal requesting such information. Each proposal for services shall also state a proposed payment schedule at a frequency no greater than monthly in such amounts as are consistent with amount of work to be performed and billed. Reimbursable expenses proposed shall be specifically identified and estimated as a part of the proposal with a statement of the maximum amount to be charged unless the Owner's request for proposal specifies otherwise.

2.4 Signatures - Consultant proposals for services under this agreement shall be signed and dated by the Consultant or an authorized representative of the Consultant (as applicable), and shall be considered binding offers to contract open for acceptance by the Owner for an indefinite duration unless limited in the proposal or withdrawn prior to acceptance by the Owner. All proposals for services under this agreement shall be on forms approved by the Owner; use of the signature block shown in this agreement on a proposal for services shall be considered an adequate signature block. In the absence of an Owner provided form, the signature block shall contain a signature line for Boone County, Missouri by its Presiding Commissioner, a signature line for attestation by the County Clerk, a signature line approving the proposal by the Director of Resource Management, and a signature line for the County Attorney approving the proposal as to legal form. In addition, the signature block shall contain a line for insertion of the date the proposal is approved by the Owner.

3. Compensation - In consideration for the Consultant's provision of services under this agreement, the Owner agrees to compensate the Consultant for services rendered in accordance with the hourly rates, unit prices and reimbursement rates for expenses set forth in the schedule for hourly rates and expense charges to be in effect for the calendar year of this agreement which is either attached to this agreement or maintained on file with the Boone County Resource Management Department and is hereby incorporated by reference. No increases in the rates and charges set forth in the attached schedule shall be permitted for this

calendar year without the written authorization of the Owner. Payments shall be made within thirty (30) days of receipt of invoice by the Owner. Invoices shall be submitted periodically as mutually agreed upon by the Owner and Consultant, or in the absence of such agreement, upon completion of the work constituting the task or project for which services are provided. Invoices for services on an hourly fee plus expense basis shall individually describe the task or project by name, show hours expended by classes of personnel in increments of not less than one-half hour and rates applied, as well as describe work performed during the invoice period; reimbursable expenses shall be itemized. Invoices for services performed on a unit price basis shall identify the task or project by name, identify and quantify units charged for services during the invoice period. Invoices for services on a lump sum basis shall identify the task or project by name and the invoiced amount. Periodic invoices shall not exceed the amounts permitted in the Consultant's proposal approved by the Owner. The Owner reserves the right to withhold payment for inadequately documented invoices until documented as required herein. The Owner further reserves the right to withhold payments for unperformed work or work not performed on a timely basis in accordance with the Consultant's proposal when delays in performance of services are not attributable to the Owner, or as a result of a billing dispute between the Owner and Consultant. However, Owner agrees to pay interest at a rate of nine percent (9%) annum on any disputed billed amounts for which payments are withheld beyond thirty (30) days of invoice if and to the extent that those disputed amounts are resolved in favor of the Consultant.

4. **Owner Responsibilities** - Owner agrees to furnish Consultant with all current and available information for each task or project assigned to Consultant, along with any information necessitated by changes in work or services initiated by the Owner which may affect services rendered thereunder.

5. **Coordination of Work and Work Product** - Consultant shall coordinate all work with the Owner's designated representative for each task or project assigned to Consultant and submit to the Owner's representative all work product in written or graphic form (and in electronic form if requested) as applicable or required. All reports, surveys, test data, memoranda, samples, plans, specifications, and other documents or materials submitted by or to the Owner shall be considered the property of the Owner. When available and requested by the Owner, work product shall be provided in electronic form at actual cost in media compatible for use with Owner software and equipment.

6. **Insurance** - Consultant shall procure and maintain professional liability insurance in such amounts as are deemed mutually agreeable to the parties and approved by the Owner or the Owner's representative in writing within thirty (30) days of this Agreement. Consultant shall also maintain general public liability insurance with coverage's no less than \$2,000,000.00 per occurrence, and worker's compensation insurance as required by state law. Failure of Consultant to obtain or maintain such insurance during this contract, or to provide proper proofs thereof upon request of the Owner, shall not diminish, waive or otherwise reduce the Consultant's obligations to maintain such insurance coverage and Consultant shall indemnify and hold the Owner and all its personnel harmless from and against any and all claims, damages, losses and expenses, including reasonable attorney's fees and litigation costs, arising out of or resulting from the performance of services, provided that any such claim, damage, loss or expenses, is caused in whole or in part by the negligent act, omission and or liability of the Consultant, its agents or employees. The Consultant shall provide the Owner with certificates of insurance

exhibiting the coverage as specified above within thirty (30) days of execution of this agreement and thereafter within five (5) working days after request by the Owner. All certificates of insurance shall contain provision that insurance provided shall not be canceled or altered except upon ten (10) days written notice to the Owner.

7. **Delegation and Subcontracting** - Unless otherwise proposed and approved in the Consultant's proposal for services, the Consultant shall not delegate or subcontract any work to be performed by the Consultant under this agreement to any other person, business or entity without the express advance written approval of the Owner for such delegation or subcontract work.

8. **Records and Samples** - To the extent not otherwise transferred to the Owner's possession, Consultant agrees to retain and provide the Owner with reasonable access to all work product, records, papers and other documents involving transactions and work related to or performed under this agreement for a period of three (3) years after this agreement expires. When services involve testing or sampling, Consultant agrees to either retain all test products or samples collected by or submitted to Consultant, or return same to the Owner as mutually agreed upon. In absence of agreement, Consultant shall not dispose of test samples or products without notice to or consent by the Owner or the Owner's representative.

9. **Additional Services** - No compensation shall be paid for any service rendered by the Consultant considered an additional service beyond the scope of services approved by the Owner unless rendition of that service and expense thereof has been authorized in writing by the Owner in advance of performance of such service. Any additional services performed by the Consultant prior to such authorization by the Owner shall be deemed a part of basic services for work performed under an Owner approved proposal for services governed by this agreement, whether enumerated in this agreement or not, for which the Consultant shall be entitled to no additional compensation.

10. **Owner Authorization** -When the term Owner is used in this agreement, it shall mean the government of Boone County, Missouri or the Boone County Commission, as the context requires. Authorization by the Owner shall mean authorization obtained by recorded majority vote of the Boone County Commission. It is further understood and agreed that no person or party is authorized to bind the Owner to any proposed agreement for services under the auspices of this agreement without having obtained the prior approval of the Boone County Commission by recorded majority vote for such authorization. In this regard, it is understood and agreed that the Consultant shall not be entitled to rely upon verbal or written representations by any agent or employee of the Owner in deviation to the terms and conditions of this agreement, or as authorization for compensation for services except as may be approved by recorded vote of the Boone County Commission. When the term Owner's representative is used, it shall mean the Director of the Boone County Resource Management Department or his designee as specified in writing. It shall be presumed that such representative shall have all necessary decision making authority with respect to services provided under this agreement and Owner approved proposals for services except such representative shall have no authority to make decisions concerning changes to the Consultant's compensation or reimbursement, or with respect to services to be performed under this agreement or Owner approved proposal for services which involve or affect cost, expense or budgetary allowances.

11. **Termination** - The Owner may and reserves the right to terminate this agreement at any time with or without cause by giving the Consultant written notice of termination. Upon receipt of such notice, Consultant shall discontinue all services in connection with the performance of services authorized under this agreement or Owner approved proposal for services and Owner shall upon invoice remit payment for all authorized services completed up to the date of termination notice. Upon payment of this invoice, the Consultant shall deliver any and all work product including drawings, plans, and specifications, or other documents, prepared as instruments of service, whether complete or in progress. It is further agreed that if services are terminated the Consultant shall be compensated for all services rendered through the date of termination not to exceed the amount authorized for services through the date of termination. If the Owner questions the extent of work on a final invoice, the Consultant shall give the Owner the opportunity to review and evaluate all work upon which the invoice is based in the offices of the Consultant prior to payment. This agreement or work performed under the provisions of this agreement may also be terminated by the Consultant upon not less than seven days written notice in the event the Owner shall substantially fail to perform in accordance with the terms and conditions of this agreement, through no fault of the Consultant. In the event of termination by the Consultant, the other provisions concerning termination contained in this paragraph shall be applicable.

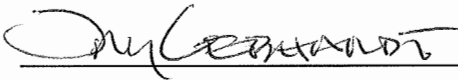
12. **Governing Law** - This agreement shall be governed by the laws of the state of Missouri and it is agreed that this agreement is made in Boone County, Missouri and that Boone County, Missouri is proper venue for any action pertaining to the interpretation or enforcement of any provision within or services performed under this agreement.

13. **Certification of Lawful Presence / Work Authorization** - Consultant shall complete and return the Work Authorization Certification attached hereto, and if applicable, the other required lawful presence documents for an individual Consultant.

14. **Miscellaneous** - This agreement constitutes the entire agreement of the parties superseding all prior negotiations, written or verbal, and may only be amended by signed writing executed by the parties through their authorized representatives hereunder.

IN WITNESS WHEREOF, the parties have executed this agreement by their duly authorized signatories effective the date and year first-above written.

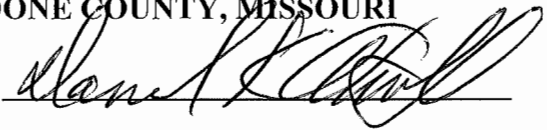
A CIVIL GROUP

By 

Title Principal Engineer

Dated: 1/2/19

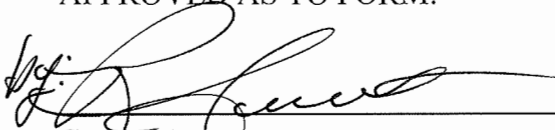
BOONE COUNTY, MISSOURI

By 

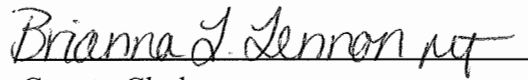
Presiding Commissioner

Dated: 1-17-19

APPROVED AS TO FORM:


County Attorney

ATTEST:


County Clerk

APPROVED:


Director, Boone County Resource Management

**WORK AUTHORIZATION CERTIFICATION
PURSUANT TO 285.530 RSMo
(FOR ALL AGREEMENTS IN EXCESS OF \$5,000.00)**

County of Boone)
)ss
State of Missouri)

My name is Jay Gebhardt. I am an authorized agent of A CIVIL GROUP, LLC (Consultant). This business is enrolled and participates in a federal work authorization program for all employees working in connection with services provided to the County. This business does not knowingly employ any person that is an unauthorized alien in connection with the services being provided. Documentation of participation in a federal work authorization program is attached hereto.

Furthermore, all subcontractors working on this contract shall affirmatively state in writing in their contracts that they are not in violation of Section 285.530.1, shall not thereafter be in violation and submit a sworn affidavit under penalty of perjury that all employees are lawfully present in the United States.

Jay Gebhardt 1/2/19
Affiant Date

JAY GEBHARDT
Printed Name

Subscribed and sworn to before me this 2nd day of January, 2019.

Kristine N. Vroman
Notary Public



A CIVIL GROUP

**FEE SCHEDULE
2019**

ENGINEER I	\$ 150 / HOUR
ENGINEER II	\$ 140 / HOUR
ENGINEER III	\$ 135 / HOUR
ENGINEER IV	\$ 125 / HOUR
DESIGNER	\$125 / HOUR
SURVEYOR I	\$ 100 / HOUR
SURVEYOR II	\$ 85 / HOUR
SURVEYOR III	\$ 75 / HOUR
DESIGN TECHNICIAN I	\$ 100 / HOUR
DESIGN TECHNICIAN II	\$ 90 / HOUR
DESIGN TECHNICIAN III	\$ 80 / HOUR
1-MAN FIELD CREW	\$ 135 / HOUR
2-MAN FIELD CREW	\$ 150 / HOUR
CLERICAL	\$65 /HOUR
OUTSIDE COPIES	ACTUAL EXPENSE
OFFICE COPIES	
LARGE COPIES	\$3.00-\$5.00/EACH
BLACK AND WHITE COPIES	\$0.50/EACH
COLOR COPIES	\$1.00/EACH



A Civil Group

2019 Discipline List

Instructions: Please place a check mark in the Services Offered box next to those disciplines provided by your firm

Discipline	Services Offered	
Architecture		
Bridge Design		
Civil Engineering	✓	
Construction Management		
Electrical Engineering		
Geotechnical Engineering	✓	Sub
Lab Testing		
Mechanical Engineering		
Planning	✓	
Structural Engineering	✓	Sub
Surveying	✓	
Traffic	✓	
Transportation		
Acoustical		
Building Enclosure Consulting		
Control System Integration		
Design/Build	✓	
Environmental		
Forensic		
GIS		
Industrial		
Interior Design		
Landscape Architecture		
Natural Gas		
Photogrammetry		
Telecommunications		

Reviewed by: De Jm

A CIVIL GROUP

**FEE SCHEDULE
2019**

ENGINEER I	\$ 150 / HOUR
ENGINEER II	\$ 140 / HOUR
ENGINEER III	\$ 135 / HOUR
ENGINEER IV	\$ 125 / HOUR

DESIGNER	\$125 / HOUR
----------	--------------

SURVEYOR I	\$ 100 / HOUR
SURVEYOR II	\$ 85 / HOUR
SURVEYOR III	\$ 75 / HOUR

DESIGN TECHNICIAN I	\$ 100 / HOUR
DESIGN TECHNICIAN II	\$ 90 / HOUR
DESIGN TECHNICIAN III	\$ 80 / HOUR

1-MAN FIELD CREW	\$ 135 / HOUR
2-MAN FIELD CREW	\$ 150 / HOUR

CLERICAL	\$65 /HOUR
----------	------------

OUTSIDE COPIES	ACTUAL EXPENSE
----------------	----------------

OFFICE COPIES

LARGE COPIES	\$3.00-\$5.00/EACH
BLACK AND WHITE COPIES	\$0.50/EACH
COLOR COPIES	\$1.00/EACH

GENERAL CONSULTANT SERVICES AGREEMENT

THIS AGREEMENT dated this 17th day of January, 2018~~(2019)~~ by and between Boone County, Missouri, a first class county and political subdivision of the state of Missouri through its County Commission, (herein "Owner") and CM Engineering, Inc (herein "Consultant").

IN CONSIDERATION OF the performance of the services rendered under this Agreement and payment for such services, the parties agree to the following:

1. **Agreement duration** – This contract shall be in effect beginning January 1, 2019 or the date of full execution; which ever is later and run through the calendar year ending on December 31, 2019. This agreement may be terminated in accordance with the terms and conditions set forth in this agreement.

2. **Services** - As authorized by the Owner in writing, the Consultant shall provide the Owner all engineering, surveying, and other professional services for the benefit of the Owner as prescribed by the Owner based upon requests for proposals for projects assigned during the term of this agreement and the Consultant shall provide the Owner, as applicable, with the services, reports, studies, surveys, plans, specifications, and other work required by the Owner's request for proposal. Consultant agrees to provide all such services in a timely manner as established by the Owner in writing for each assigned project, or in the absence of the designation, within a reasonable time after receipt of Owner directives. Consultant agrees to provide services by and through qualified personnel under standards and conditions generally accepted by professionals in the field or occupations for which services are provided. Services shall be provided based only upon requests for proposals provided to the Consultant by the Owner or Owner's representative and to which the Consultant prepares and submits a written proposal for services which is approved by the Owner in writing. No work shall be performed nor shall compensation be paid for Consultant work performed without an Owner approved written proposal for professional services. Proposals for services shall be in written form, as required by the request for proposal, and shall be specifically responsive to the criteria provided by the Owner in its request for proposal. All work performed by the Consultant, based upon Owner approved proposals submitted by the Consultant, shall be subject to the terms and conditions of this agreement unless otherwise specifically agreed upon by the Owner and Consultant in writing. All proposals for work submitted by the Consultant to the Owner for work shall at a minimum contain the following:

2.1 **Scope of Services** - Each proposal for services shall contain a detailed description of work to be performed by the Consultant. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to the request with the same or greater level of specificity required by the request for proposal. The Consultant shall specifically identify services which are included as basic services and those services which are excluded from basic services in the proposal. Services which the Consultant does not identify as excluded from basic services under the proposal and which are necessary for successful completion of the work in the judgment of the Owner shall be presumed to be a part of basic services under the proposal. If a request for proposal requires the Consultant to provide optional services, the Consultant's proposal shall respond to the options requested, or provide

reasons why the Consultant cannot provide or respond to the request for optional services.

2.2 **Time for Completion** - Each proposal for services shall contain a detailed description of the estimated time to complete each task or item of work to be performed by the Consultant under the proposal. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to any request for estimated or maximum completion times for work with the same or greater level of specificity required by the request for proposal.

2.3 **Compensation** - Each proposal for services shall state the basis of compensation on either: (1) an hourly fee plus expense basis with a statement of a maximum compensation to be charged, or, (2) a lump sum payment of compensation for all work to be performed, or, (3) a payment based upon unit prices. Proposals for compensation for an hourly fee plus expense basis shall provide detailed time and expense estimates to support a maximum contract amount to be charged and shall be consistent with the hourly rates, unit prices and reimbursement rates made a part of this agreement by reference in paragraph two (2) below. When the Owner or Owner's representative requests the Consultant to provide work on an hourly fee plus expense basis, the Consultant's proposal shall be responsive to the request and shall not propose payment on another basis unless otherwise authorized. Unit price proposals shall identify and estimate the quantity of units as a part of the proposal when they can be identified and estimated, or as necessary in response to a particular request for proposal requesting such information. Each proposal for services shall also state a proposed payment schedule at a frequency no greater than monthly in such amounts as are consistent with amount of work to be performed and billed. Reimbursable expenses proposed shall be specifically identified and estimated as a part of the proposal with a statement of the maximum amount to be charged unless the Owner's request for proposal specifies otherwise.

2.4 **Signatures** - Consultant proposals for services under this agreement shall be signed and dated by the Consultant or an authorized representative of the Consultant (as applicable), and shall be considered binding offers to contract open for acceptance by the Owner for an indefinite duration unless limited in the proposal or withdrawn prior to acceptance by the Owner. All proposals for services under this agreement shall be on forms approved by the Owner; use of the signature block shown in this agreement on a proposal for services shall be considered an adequate signature block. In the absence of an Owner provided form, the signature block shall contain a signature line for Boone County, Missouri by its Presiding Commissioner, a signature line for attestation by the County Clerk, a signature line approving the proposal by the Director of Resource Management, and a signature line for the County Attorney approving the proposal as to legal form. In addition, the signature block shall contain a line for insertion of the date the proposal is approved by the Owner.

3. **Compensation** - In consideration for the Consultant's provision of services under this agreement, the Owner agrees to compensate the Consultant for services rendered in accordance with the hourly rates, unit prices and reimbursement rates for expenses set forth in the schedule for hourly rates and expense charges to be in effect for the calendar year of this agreement which is either attached to this agreement or maintained on file with the Boone County Resource Management Department and is hereby incorporated by reference. No increases in the rates and charges set forth in the attached schedule shall be permitted for this

calendar year without the written authorization of the Owner. Payments shall be made within thirty (30) days of receipt of invoice by the Owner. Invoices shall be submitted periodically as mutually agreed upon by the Owner and Consultant, or in the absence of such agreement, upon completion of the work constituting the task or project for which services are provided. Invoices for services on an hourly fee plus expense basis shall individually describe the task or project by name, show hours expended by classes of personnel in increments of not less than one-half hour and rates applied, as well as describe work performed during the invoice period; reimbursable expenses shall be itemized. Invoices for services performed on a unit price basis shall identify the task or project by name, identify and quantify units charged for services during the invoice period. Invoices for services on a lump sum basis shall identify the task or project by name and the invoiced amount. Periodic invoices shall not exceed the amounts permitted in the Consultant's proposal approved by the Owner. The Owner reserves the right to withhold payment for inadequately documented invoices until documented as required herein. The Owner further reserves the right to withhold payments for unperformed work or work not performed on a timely basis in accordance with the Consultant's proposal when delays in performance of services are not attributable to the Owner, or as a result of a billing dispute between the Owner and Consultant. However, Owner agrees to pay interest at a rate of nine percent (9%) annum on any disputed billed amounts for which payments are withheld beyond thirty (30) days of invoice if and to the extent that those disputed amounts are resolved in favor of the Consultant.

4. **Owner Responsibilities** - Owner agrees to furnish Consultant with all current and available information for each task or project assigned to Consultant, along with any information necessitated by changes in work or services initiated by the Owner which may affect services rendered thereunder.

5. **Coordination of Work and Work Product** - Consultant shall coordinate all work with the Owner's designated representative for each task or project assigned to Consultant and submit to the Owner's representative all work product in written or graphic form (and in electronic form if requested) as applicable or required. All reports, surveys, test data, memoranda, samples, plans, specifications, and other documents or materials submitted by or to the Owner shall be considered the property of the Owner. When available and requested by the Owner, work product shall be provided in electronic form at actual cost in media compatible for use with Owner software and equipment.

6. **Insurance** - Consultant shall procure and maintain professional liability insurance in such amounts as are deemed mutually agreeable to the parties and approved by the Owner or the Owner's representative in writing within thirty (30) days of this Agreement. Consultant shall also maintain general public liability insurance with coverage's no less than \$2,000,000.00 per occurrence, and worker's compensation insurance as required by state law. Failure of Consultant to obtain or maintain such insurance during this contract, or to provide proper proofs thereof upon request of the Owner, shall not diminish, waive or otherwise reduce the Consultant's obligations to maintain such insurance coverage and Consultant shall indemnify and hold the Owner and all its personnel harmless from and against any and all claims, damages, losses and expenses, including reasonable attorney's fees and litigation costs, arising out of or resulting from the performance of services, provided that any such claim, damage, loss or expenses, is caused in whole or in part by the negligent act, omission and or liability of the Consultant, its agents or employees. The Consultant shall provide the Owner with certificates of insurance

exhibiting the coverage as specified above within thirty (30) days of execution of this agreement and thereafter within five (5) working days after request by the Owner. All certificates of insurance shall contain provision that insurance provided shall not be canceled or altered except upon ten (10) days written notice to the Owner.

7. **Delegation and Subcontracting** - Unless otherwise proposed and approved in the Consultant's proposal for services, the Consultant shall not delegate or subcontract any work to be performed by the Consultant under this agreement to any other person, business or entity without the express advance written approval of the Owner for such delegation or subcontract work.

8. **Records and Samples** - To the extent not otherwise transferred to the Owner's possession, Consultant agrees to retain and provide the Owner with reasonable access to all work product, records, papers and other documents involving transactions and work related to or performed under this agreement for a period of three (3) years after this agreement expires. When services involve testing or sampling, Consultant agrees to either retain all test products or samples collected by or submitted to Consultant, or return same to the Owner as mutually agreed upon. In absence of agreement, Consultant shall not dispose of test samples or products without notice to or consent by the Owner or the Owner's representative.

9. **Additional Services** - No compensation shall be paid for any service rendered by the Consultant considered an additional service beyond the scope of services approved by the Owner unless rendition of that service and expense thereof has been authorized in writing by the Owner in advance of performance of such service. Any additional services performed by the Consultant prior to such authorization by the Owner shall be deemed a part of basic services for work performed under an Owner approved proposal for services governed by this agreement, whether enumerated in this agreement or not, for which the Consultant shall be entitled to no additional compensation.

10. **Owner Authorization** - When the term Owner is used in this agreement, it shall mean the government of Boone County, Missouri or the Boone County Commission, as the context requires. Authorization by the Owner shall mean authorization obtained by recorded majority vote of the Boone County Commission. It is further understood and agreed that no person or party is authorized to bind the Owner to any proposed agreement for services under the auspices of this agreement without having obtained the prior approval of the Boone County Commission by recorded majority vote for such authorization. In this regard, it is understood and agreed that the Consultant shall not be entitled to rely upon verbal or written representations by any agent or employee of the Owner in deviation to the terms and conditions of this agreement, or as authorization for compensation for services except as may be approved by recorded vote of the Boone County Commission. When the term Owner's representative is used, it shall mean the Director of the Boone County Resource Management Department or his designee as specified in writing. It shall be presumed that such representative shall have all necessary decision making authority with respect to services provided under this agreement and Owner approved proposals for services except such representative shall have no authority to make decisions concerning changes to the Consultant's compensation or reimbursement, or with respect to services to be performed under this agreement or Owner approved proposal for services which involve or affect cost, expense or budgetary allowances.

11. **Termination** - The Owner may and reserves the right to terminate this agreement at any time with or without cause by giving the Consultant written notice of termination. Upon receipt of such notice, Consultant shall discontinue all services in connection with the performance of services authorized under this agreement or Owner approved proposal for services and Owner shall upon invoice remit payment for all authorized services completed up to the date of termination notice. Upon payment of this invoice, the Consultant shall deliver any and all work product including drawings, plans, and specifications, or other documents, prepared as instruments of service, whether complete or in progress. It is further agreed that if services are terminated the Consultant shall be compensated for all services rendered through the date of termination not to exceed the amount authorized for services through the date of termination. If the Owner questions the extent of work on a final invoice, the Consultant shall give the Owner the opportunity to review and evaluate all work upon which the invoice is based in the offices of the Consultant prior to payment. This agreement or work performed under the provisions of this agreement may also be terminated by the Consultant upon not less than seven days written notice in the event the Owner shall substantially fail to perform in accordance with the terms and conditions of this agreement, through no fault of the Consultant. In the event of termination by the Consultant, the other provisions concerning termination contained in this paragraph shall be applicable.

12. **Governing Law** - This agreement shall be governed by the laws of the state of Missouri and it is agreed that this agreement is made in Boone County, Missouri and that Boone County, Missouri is proper venue for any action pertaining to the interpretation or enforcement of any provision within or services performed under this agreement.

13. **Certification of Lawful Presence / Work Authorization** - Consultant shall complete and return the Work Authorization Certification attached hereto, and if applicable, the other required lawful presence documents for an individual Consultant.

14. **Miscellaneous** - This agreement constitutes the entire agreement of the parties superseding all prior negotiations, written or verbal, and may only be amended by signed writing executed by the parties through their authorized representatives hereunder.

IN WITNESS WHEREOF, the parties have executed this agreement by their duly authorized signatories effective the date and year first-above written.

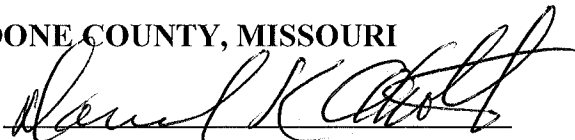
CM ENGINEERING, INC

By 

Title CEO

Dated: 12/26/2018


BOONE COUNTY, MISSOURI

By 


Presiding Commissioner

Dated: 1-17-19

APPROVED AS TO FORM:

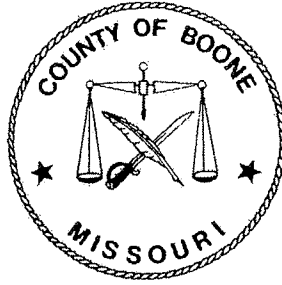
By: 
County Attorney

ATTEST:


County Clerk

APPROVED:


Director, Boone County Resource Management



CM Engineering, Inc

2019 Discipline List

Instructions: Please place a check mark in the Services Offered box next to those disciplines provided by your firm

Discipline	Services Offered
Architecture	
Bridge Design	
Civil Engineering	
Construction Management	X
Electrical Engineering	X
Geotechnical Engineering	
Lab Testing	
Mechanical Engineering	X
Planning	X
Structural Engineering	
Surveying	
Traffic	
Transportation	
Acoustical	
Building Enclosure Consulting	
Control System Integration	X
Design/Build	X
Environmental	
Forensic	
GIS	
Industrial	
Interior Design	
Landscape Architecture	
Natural Gas	X
Photogrammetry	
Telecommunications	

Reviewed by: Jm



Fee Schedule

"Bright Solutions in Engineering"

Principal Engineer	\$200.00 / hour
Sr. Project Manager	\$200.00 / hour
Project Manager	\$120.00 / hour
Project Engineer	\$125.00 / hour
Designer	\$100.00 / hour
Drafter	\$87.50 / hour
Administrative / Clerical	\$81.25 / hour

Expenses

Outside Reproduction:		Cost plus 10%
Inside Reproduction:	24" by 36" BW on Bond Paper	\$2.48/Sheet
	30" by 42" BW on Bond Paper	\$3.62/Sheet
	8-1/2" by 11" BW on Bond Paper	\$0.25/Sheet
	8-1/2" by 11" Color on Bond Paper	\$0.32/Sheet
	11" by 17" BW on Bond Paper	\$0.57/Sheet
	11" by 17" Color on Bond Paper	\$0.63/Sheet
	12" by 18" BW on Bond Paper	\$0.63/Sheet
	12" by 18" Color on Bond Paper	\$0.69/Sheet
Out of Office Area Travel:	Current Federal Allowance per mile plus subsistence expenses.	
Sub- Consultants and Contractors:		Cost Plus 10%

Insurance Limits

Comprehensive General Liability:		
Each Occurrence		\$2,000,000
General Aggregate		\$4,000,000
Products/Completed Operations Aggregate		\$4,000,000
Automobile Liability:		
Hired and Non-Owned Auto Liability		
Combined Single Limit for Property		
Damage and Bodily Injury		\$2,000,000
Commercial Umbrella Liability:		
Each Occurrence		\$1,000,000
Aggregate Limit		\$1,000,000
Workers Compensation:		
State		Statutory
Employers Liability		\$1,000,000
Professional Liability:		
Per Claim		\$1,000,000
Aggregate Limit		\$2,000,000
Deductible Each Claim		\$10,000
Deductible All Claims		\$30,000

Professional Liability Insurance shall be continued in force for 3 years after completion of the services provided. CM Engineering, Inc. will furnish upon request any necessary certificates showing the type, amount, effective dates and dates of expiration of policies. Cancellation notice will be given as per the terms and conditions of the policy. Higher limits may be purchased on a per project basis and will be charged to the customer accordingly.

CM Engineering, Inc. require all payments 30 day from invoice date. Payments not received by the due date shall bear interest at the rate of 10% annum.

GENERAL CONSULTANT SERVICES AGREEMENT

THIS AGREEMENT dated this 17th day of January, 2018/2019 by and between Boone County, Missouri, a first class county and political subdivision of the state of Missouri through its County Commission, (herein "Owner") and Crockett Engineering Consultants, LLC (herein "Consultant").

IN CONSIDERATION OF the performance of the services rendered under this Agreement and payment for such services, the parties agree to the following:

1. **Agreement duration** – This contract shall be in effect beginning January 1, 2019 or the date of full execution; which ever is later and run through the calendar year ending on December 31, 2019. This agreement may be terminated in accordance with the terms and conditions set forth in this agreement.

2. **Services** - As authorized by the Owner in writing, the Consultant shall provide the Owner all engineering, surveying, and other professional services for the benefit of the Owner as prescribed by the Owner based upon requests for proposals for projects assigned during the term of this agreement and the Consultant shall provide the Owner, as applicable, with the services, reports, studies, surveys, plans, specifications, and other work required by the Owner's request for proposal. Consultant agrees to provide all such services in a timely manner as established by the Owner in writing for each assigned project, or in the absence of the designation, within a reasonable time after receipt of Owner directives. Consultant agrees to provide services by and through qualified personnel under standards and conditions generally accepted by professionals in the field or occupations for which services are provided. Services shall be provided based only upon requests for proposals provided to the Consultant by the Owner or Owner's representative and to which the Consultant prepares and submits a written proposal for services which is approved by the Owner in writing. No work shall be performed nor shall compensation be paid for Consultant work performed without an Owner approved written proposal for professional services. Proposals for services shall be in written form, as required by the request for proposal, and shall be specifically responsive to the criteria provided by the Owner in its request for proposal. All work performed by the Consultant, based upon Owner approved proposals submitted by the Consultant, shall be subject to the terms and conditions of this agreement unless otherwise specifically agreed upon by the Owner and Consultant in writing. All proposals for work submitted by the Consultant to the Owner for work shall at a minimum contain the following:

2.1 **Scope of Services** - Each proposal for services shall contain a detailed description of work to be performed by the Consultant. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to the request with the same or greater level of specificity required by the request for proposal. The Consultant shall specifically identify services which are included as basic services and those services which are excluded from basic services in the proposal. Services which the Consultant does not identify as excluded from basic services under the proposal and which are necessary for successful completion of the work in the judgment of the Owner shall be presumed to be a part of basic services under the proposal. If a request for proposal requires the Consultant to provide optional services, the Consultant's proposal shall respond to the options requested, or provide

reasons why the Consultant cannot provide or respond to the request for optional services.

2.2 **Time for Completion** - Each proposal for services shall contain a detailed description of the estimated time to complete each task or item of work to be performed by the Consultant under the proposal. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to any request for estimated or maximum completion times for work with the same or greater level of specificity required by the request for proposal.

2.3 **Compensation** - Each proposal for services shall state the basis of compensation on either: (1) an hourly fee plus expense basis with a statement of a maximum compensation to be charged, or, (2) a lump sum payment of compensation for all work to be performed, or, (3) a payment based upon unit prices. Proposals for compensation for an hourly fee plus expense basis shall provide detailed time and expense estimates to support a maximum contract amount to be charged and shall be consistent with the hourly rates, unit prices and reimbursement rates made a part of this agreement by reference in paragraph two (2) below. When the Owner or Owner's representative requests the Consultant to provide work on an hourly fee plus expense basis, the Consultant's proposal shall be responsive to the request and shall not propose payment on another basis unless otherwise authorized. Unit price proposals shall identify and estimate the quantity of units as a part of the proposal when they can be identified and estimated, or as necessary in response to a particular request for proposal requesting such information. Each proposal for services shall also state a proposed payment schedule at a frequency no greater than monthly in such amounts as are consistent with amount of work to be performed and billed. Reimbursable expenses proposed shall be specifically identified and estimated as a part of the proposal with a statement of the maximum amount to be charged unless the Owner's request for proposal specifies otherwise.

2.4 **Signatures** - Consultant proposals for services under this agreement shall be signed and dated by the Consultant or an authorized representative of the Consultant (as applicable), and shall be considered binding offers to contract open for acceptance by the Owner for an indefinite duration unless limited in the proposal or withdrawn prior to acceptance by the Owner. All proposals for services under this agreement shall be on forms approved by the Owner; use of the signature block shown in this agreement on a proposal for services shall be considered an adequate signature block. In the absence of an Owner provided form, the signature block shall contain a signature line for Boone County, Missouri by its Presiding Commissioner, a signature line for attestation by the County Clerk, a signature line approving the proposal by the Director of Resource Management, and a signature line for the County Attorney approving the proposal as to legal form. In addition, the signature block shall contain a line for insertion of the date the proposal is approved by the Owner.

3. **Compensation** - In consideration for the Consultant's provision of services under this agreement, the Owner agrees to compensate the Consultant for services rendered in accordance with the hourly rates, unit prices and reimbursement rates for expenses set forth in the schedule for hourly rates and expense charges to be in effect for the calendar year of this agreement which is either attached to this agreement or maintained on file with the Boone County Resource Management Department and is hereby incorporated by reference. No increases in the rates and charges set forth in the attached schedule shall be permitted for this

calendar year without the written authorization of the Owner. Payments shall be made within thirty (30) days of receipt of invoice by the Owner. Invoices shall be submitted periodically as mutually agreed upon by the Owner and Consultant, or in the absence of such agreement, upon completion of the work constituting the task or project for which services are provided. Invoices for services on an hourly fee plus expense basis shall individually describe the task or project by name, show hours expended by classes of personnel in increments of not less than one-half hour and rates applied, as well as describe work performed during the invoice period; reimbursable expenses shall be itemized. Invoices for services performed on a unit price basis shall identify the task or project by name, identify and quantify units charged for services during the invoice period. Invoices for services on a lump sum basis shall identify the task or project by name and the invoiced amount. Periodic invoices shall not exceed the amounts permitted in the Consultant's proposal approved by the Owner. The Owner reserves the right to withhold payment for inadequately documented invoices until documented as required herein. The Owner further reserves the right to withhold payments for unperformed work or work not performed on a timely basis in accordance with the Consultant's proposal when delays in performance of services are not attributable to the Owner, or as a result of a billing dispute between the Owner and Consultant. However, Owner agrees to pay interest at a rate of nine percent (9%) annum on any disputed billed amounts for which payments are withheld beyond thirty (30) days of invoice if and to the extent that those disputed amounts are resolved in favor of the Consultant.

4. **Owner Responsibilities** - Owner agrees to furnish Consultant with all current and available information for each task or project assigned to Consultant, along with any information necessitated by changes in work or services initiated by the Owner which may affect services rendered thereunder.

5. **Coordination of Work and Work Product** - Consultant shall coordinate all work with the Owner's designated representative for each task or project assigned to Consultant and submit to the Owner's representative all work product in written or graphic form (and in electronic form if requested) as applicable or required. All reports, surveys, test data, memoranda, samples, plans, specifications, and other documents or materials submitted by or to the Owner shall be considered the property of the Owner. When available and requested by the Owner, work product shall be provided in electronic form at actual cost in media compatible for use with Owner software and equipment.

6. **Insurance** - Consultant shall procure and maintain professional liability insurance in such amounts as are deemed mutually agreeable to the parties and approved by the Owner or the Owner's representative in writing within thirty (30) days of this Agreement. Consultant shall also maintain general public liability insurance with coverage's no less than \$2,000,000.00 per occurrence, and worker's compensation insurance as required by state law. Failure of Consultant to obtain or maintain such insurance during this contract, or to provide proper proofs thereof upon request of the Owner, shall not diminish, waive or otherwise reduce the Consultant's obligations to maintain such insurance coverage and Consultant shall indemnify and hold the Owner and all its personnel harmless from and against any and all claims, damages, losses and expenses, including reasonable attorney's fees and litigation costs, arising out of or resulting from the performance of services, provided that any such claim, damage, loss or expenses, is caused in whole or in part by the negligent act, omission and or liability of the Consultant, its agents or employees. The Consultant shall provide the Owner with certificates of insurance

exhibiting the coverage as specified above within thirty (30) days of execution of this agreement and thereafter within five (5) working days after request by the Owner. All certificates of insurance shall contain provision that insurance provided shall not be canceled or altered except upon ten (10) days written notice to the Owner.

7. **Delegation and Subcontracting** - Unless otherwise proposed and approved in the Consultant's proposal for services, the Consultant shall not delegate or subcontract any work to be performed by the Consultant under this agreement to any other person, business or entity without the express advance written approval of the Owner for such delegation or subcontract work.

8. **Records and Samples** - To the extent not otherwise transferred to the Owner's possession, Consultant agrees to retain and provide the Owner with reasonable access to all work product, records, papers and other documents involving transactions and work related to or performed under this agreement for a period of three (3) years after this agreement expires. When services involve testing or sampling, Consultant agrees to either retain all test products or samples collected by or submitted to Consultant, or return same to the Owner as mutually agreed upon. In absence of agreement, Consultant shall not dispose of test samples or products without notice to or consent by the Owner or the Owner's representative.

9. **Additional Services** - No compensation shall be paid for any service rendered by the Consultant considered an additional service beyond the scope of services approved by the Owner unless rendition of that service and expense thereof has been authorized in writing by the Owner in advance of performance of such service. Any additional services performed by the Consultant prior to such authorization by the Owner shall be deemed a part of basic services for work performed under an Owner approved proposal for services governed by this agreement, whether enumerated in this agreement or not, for which the Consultant shall be entitled to no additional compensation.

10. **Owner Authorization** - When the term Owner is used in this agreement, it shall mean the government of Boone County, Missouri or the Boone County Commission, as the context requires. Authorization by the Owner shall mean authorization obtained by recorded majority vote of the Boone County Commission. It is further understood and agreed that no person or party is authorized to bind the Owner to any proposed agreement for services under the auspices of this agreement without having obtained the prior approval of the Boone County Commission by recorded majority vote for such authorization. In this regard, it is understood and agreed that the Consultant shall not be entitled to rely upon verbal or written representations by any agent or employee of the Owner in deviation to the terms and conditions of this agreement, or as authorization for compensation for services except as may be approved by recorded vote of the Boone County Commission. When the term Owner's representative is used, it shall mean the Director of the Boone County Resource Management Department or his designee as specified in writing. It shall be presumed that such representative shall have all necessary decision making authority with respect to services provided under this agreement and Owner approved proposals for services except such representative shall have no authority to make decisions concerning changes to the Consultant's compensation or reimbursement, or with respect to services to be performed under this agreement or Owner approved proposal for services which involve or affect cost, expense or budgetary allowances.

11. **Termination** - The Owner may and reserves the right to terminate this agreement at any time with or without cause by giving the Consultant written notice of termination. Upon receipt of such notice, Consultant shall discontinue all services in connection with the performance of services authorized under this agreement or Owner approved proposal for services and Owner shall upon invoice remit payment for all authorized services completed up to the date of termination notice. Upon payment of this invoice, the Consultant shall deliver any and all work product including drawings, plans, and specifications, or other documents, prepared as instruments of service, whether complete or in progress. It is further agreed that if services are terminated the Consultant shall be compensated for all services rendered through the date of termination not to exceed the amount authorized for services through the date of termination. If the Owner questions the extent of work on a final invoice, the Consultant shall give the Owner the opportunity to review and evaluate all work upon which the invoice is based in the offices of the Consultant prior to payment. This agreement or work performed under the provisions of this agreement may also be terminated by the Consultant upon not less than seven days written notice in the event the Owner shall substantially fail to perform in accordance with the terms and conditions of this agreement, through no fault of the Consultant. In the event of termination by the Consultant, the other provisions concerning termination contained in this paragraph shall be applicable.

12. **Governing Law** - This agreement shall be governed by the laws of the state of Missouri and it is agreed that this agreement is made in Boone County, Missouri and that Boone County, Missouri is proper venue for any action pertaining to the interpretation or enforcement of any provision within or services performed under this agreement.

13. **Certification of Lawful Presence / Work Authorization** - Consultant shall complete and return the Work Authorization Certification attached hereto, and if applicable, the other required lawful presence documents for an individual Consultant.

14. **Miscellaneous** - This agreement constitutes the entire agreement of the parties superseding all prior negotiations, written or verbal, and may only be amended by signed writing executed by the parties through their authorized representatives hereunder.

IN WITNESS WHEREOF, the parties have executed this agreement by their duly authorized signatories effective the date and year first-above written.

CROCKETT ENGINEERING CONSULTANTS, LLC BOONE COUNTY, MISSOURI

By 

By 

Presiding Commissioner

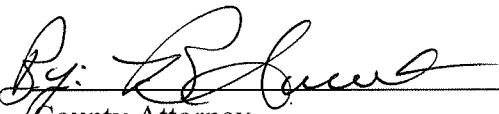
Title Partner


Dated: 12-20-18

Dated: 1-17-19

APPROVED AS TO FORM:

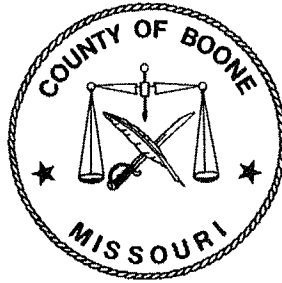
ATTEST:

By: 
County Attorney


County Clerk

APPROVED:


Director, Boone County Resource Management



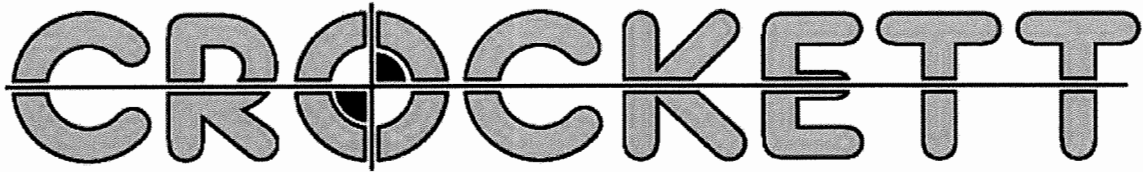
**Crockett Engineering
Consultants**

2019 Discipline List

*Instructions: Please place a check mark in the
Services Offered box next to those disciplines
provided by your firm*

Discipline	Services Offered	
Architecture		
Bridge Design		
Civil Engineering	✓	
Construction Management		
Electrical Engineering		
Geotechnical Engineering		
Lab Testing		
Mechanical Engineering		
Planning	✓	
Structural Engineering	✓	
Surveying	✓	
Traffic	✓	Sub
Transportation	✓	
Acoustical		
Building Enclosure Consulting		
Control System Integration		
Design/Build	✓	
Environmental	✓	Sub
Forensic	✓	Sub
GIS		
Industrial		
Interior Design		
Landscape Architecture		
Natural Gas		
Photogrammetry		
Telecommunications		
Water Resources	✓	

Reviewed by: *Jm*



ENGINEERING CONSULTANTS

1000 W Nifong Blvd., Bldg. 1 • Columbia, MO 65203

January 1, 2019

FEE SCHEDULE

PERSONNEL	COST/HOUR
Professional V	\$150
Professional IV	\$130
Professional III	\$110
Professional II	\$100
Professional I	\$90
Technician III	\$100
Technician II	\$80
Technician I	\$65
Clerical	\$50
Two-Man Survey Crew	\$135
One-Man Survey Crew	\$125

Effective through December 31, 2019

GENERAL CONSULTANT SERVICES AGREEMENT

THIS AGREEMENT dated this 17th day of January, 2019 by and between Boone County, Missouri, a first class county and political subdivision of the state of Missouri through its County Commission, (herein "Owner") and Malicoat-Winslow Engineers, P.C. (herein "Consultant").

IN CONSIDERATION OF the performance of the services rendered under this Agreement and payment for such services, the parties agree to the following:

1. **Agreement duration** – This contract shall be in effect beginning January 1, 2019 or the date of full execution; which ever is later and run through the calendar year ending on December 31, 2019. This agreement may be terminated in accordance with the terms and conditions set forth in this agreement.

2. **Services** - As authorized by the Owner in writing, the Consultant shall provide the Owner all engineering, surveying, and other professional services for the benefit of the Owner as prescribed by the Owner based upon requests for proposals for projects assigned during the term of this agreement and the Consultant shall provide the Owner, as applicable, with the services, reports, studies, surveys, plans, specifications, and other work required by the Owner's request for proposal. Consultant agrees to provide all such services in a timely manner as established by the Owner in writing for each assigned project, or in the absence of the designation, within a reasonable time after receipt of Owner directives. Consultant agrees to provide services by and through qualified personnel under standards and conditions generally accepted by professionals in the field or occupations for which services are provided. Services shall be provided based only upon requests for proposals provided to the Consultant by the Owner or Owner's representative and to which the Consultant prepares and submits a written proposal for services which is approved by the Owner in writing. No work shall be performed nor shall compensation be paid for Consultant work performed without an Owner approved written proposal for professional services. Proposals for services shall be in written form, as required by the request for proposal, and shall be specifically responsive to the criteria provided by the Owner in its request for proposal. All work performed by the Consultant, based upon Owner approved proposals submitted by the Consultant, shall be subject to the terms and conditions of this agreement unless otherwise specifically agreed upon by the Owner and Consultant in writing. All proposals for work submitted by the Consultant to the Owner for work shall at a minimum contain the following:

2.1 **Scope of Services** - Each proposal for services shall contain a detailed description of work to be performed by the Consultant. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to the request with the same or greater level of specificity required by the request for proposal. The Consultant shall specifically identify services which are included as basic services and those services which are excluded from basic services in the proposal. Services which the Consultant does not identify as excluded from basic services under the proposal and which are necessary for successful completion of the work in the judgment of the Owner shall be presumed to be a part of basic services under the proposal. If a request for proposal requires the Consultant to provide optional services, the Consultant's proposal shall respond to the options requested, or provide

reasons why the Consultant cannot provide or respond to the request for optional services.

2.2 **Time for Completion** - Each proposal for services shall contain a detailed description of the estimated time to complete each task or item of work to be performed by the Consultant under the proposal. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to any request for estimated or maximum completion times for work with the same or greater level of specificity required by the request for proposal.

2.3 **Compensation** - Each proposal for services shall state the basis of compensation on either: (1) an hourly fee plus expense basis with a statement of a maximum compensation to be charged, or, (2) a lump sum payment of compensation for all work to be performed, or, (3) a payment based upon unit prices. Proposals for compensation for an hourly fee plus expense basis shall provide detailed time and expense estimates to support a maximum contract amount to be charged and shall be consistent with the hourly rates, unit prices and reimbursement rates made a part of this agreement by reference in paragraph two (2) below. When the Owner or Owner's representative requests the Consultant to provide work on an hourly fee plus expense basis, the Consultant's proposal shall be responsive to the request and shall not propose payment on another basis unless otherwise authorized. Unit price proposals shall identify and estimate the quantity of units as a part of the proposal when they can be identified and estimated, or as necessary in response to a particular request for proposal requesting such information. Each proposal for services shall also state a proposed payment schedule at a frequency no greater than monthly in such amounts as are consistent with amount of work to be performed and billed. Reimbursable expenses proposed shall be specifically identified and estimated as a part of the proposal with a statement of the maximum amount to be charged unless the Owner's request for proposal specifies otherwise.

2.4 **Signatures** - Consultant proposals for services under this agreement shall be signed and dated by the Consultant or an authorized representative of the Consultant (as applicable), and shall be considered binding offers to contract open for acceptance by the Owner for an indefinite duration unless limited in the proposal or withdrawn prior to acceptance by the Owner. All proposals for services under this agreement shall be on forms approved by the Owner; use of the signature block shown in this agreement on a proposal for services shall be considered an adequate signature block. In the absence of an Owner provided form, the signature block shall contain a signature line for Boone County, Missouri by its Presiding Commissioner, a signature line for attestation by the County Clerk, a signature line approving the proposal by the Director of Resource Management, and a signature line for the County Attorney approving the proposal as to legal form. In addition, the signature block shall contain a line for insertion of the date the proposal is approved by the Owner.

3. **Compensation** - In consideration for the Consultant's provision of services under this agreement, the Owner agrees to compensate the Consultant for services rendered in accordance with the hourly rates, unit prices and reimbursement rates for expenses set forth in the schedule for hourly rates and expense charges to be in effect for the calendar year of this agreement which is either attached to this agreement or maintained on file with the Boone County Resource Management Department and is hereby incorporated by reference. No increases in the rates and charges set forth in the attached schedule shall be permitted for this

calendar year without the written authorization of the Owner. Payments shall be made within thirty (30) days of receipt of invoice by the Owner. Invoices shall be submitted periodically as mutually agreed upon by the Owner and Consultant, or in the absence of such agreement, upon completion of the work constituting the task or project for which services are provided. Invoices for services on an hourly fee plus expense basis shall individually describe the task or project by name, show hours expended by classes of personnel in increments of not less than one-half hour and rates applied, as well as describe work performed during the invoice period; reimbursable expenses shall be itemized. Invoices for services performed on a unit price basis shall identify the task or project by name, identify and quantify units charged for services during the invoice period. Invoices for services on a lump sum basis shall identify the task or project by name and the invoiced amount. Periodic invoices shall not exceed the amounts permitted in the Consultant's proposal approved by the Owner. The Owner reserves the right to withhold payment for inadequately documented invoices until documented as required herein. The Owner further reserves the right to withhold payments for unperformed work or work not performed on a timely basis in accordance with the Consultant's proposal when delays in performance of services are not attributable to the Owner, or as a result of a billing dispute between the Owner and Consultant. However, Owner agrees to pay interest at a rate of nine percent (9%) annum on any disputed billed amounts for which payments are withheld beyond thirty (30) days of invoice if and to the extent that those disputed amounts are resolved in favor of the Consultant.

4. **Owner Responsibilities** - Owner agrees to furnish Consultant with all current and available information for each task or project assigned to Consultant, along with any information necessitated by changes in work or services initiated by the Owner which may affect services rendered thereunder.

5. **Coordination of Work and Work Product** - Consultant shall coordinate all work with the Owner's designated representative for each task or project assigned to Consultant and submit to the Owner's representative all work product in written or graphic form (and in electronic form if requested) as applicable or required. All reports, surveys, test data, memoranda, samples, plans, specifications, and other documents or materials submitted by or to the Owner shall be considered the property of the Owner. When available and requested by the Owner, work product shall be provided in electronic form at actual cost in media compatible for use with Owner software and equipment.

6. **Insurance** - Consultant shall procure and maintain professional liability insurance in such amounts as are deemed mutually agreeable to the parties and approved by the Owner or the Owner's representative in writing within thirty (30) days of this Agreement. Consultant shall also maintain general public liability insurance with coverage's no less than \$2,000,000.00 per occurrence, and worker's compensation insurance as required by state law. Failure of Consultant to obtain or maintain such insurance during this contract, or to provide proper proofs thereof upon request of the Owner, shall not diminish, waive or otherwise reduce the Consultant's obligations to maintain such insurance coverage and Consultant shall indemnify and hold the Owner and all its personnel harmless from and against any and all claims, damages, losses and expenses, including reasonable attorney's fees and litigation costs, arising out of or resulting from the performance of services, provided that any such claim, damage, loss or expenses, is caused in whole or in part by the negligent act, omission and or liability of the Consultant, its agents or employees. The Consultant shall provide the Owner with certificates of insurance

exhibiting the coverage as specified above within thirty (30) days of execution of this agreement and thereafter within five (5) working days after request by the Owner. All certificates of insurance shall contain provision that insurance provided shall not be canceled or altered except upon ten (10) days written notice to the Owner.

7. **Delegation and Subcontracting** - Unless otherwise proposed and approved in the Consultant's proposal for services, the Consultant shall not delegate or subcontract any work to be performed by the Consultant under this agreement to any other person, business or entity without the express advance written approval of the Owner for such delegation or subcontract work.

8. **Records and Samples** - To the extent not otherwise transferred to the Owner's possession, Consultant agrees to retain and provide the Owner with reasonable access to all work product, records, papers and other documents involving transactions and work related to or performed under this agreement for a period of three (3) years after this agreement expires. When services involve testing or sampling, Consultant agrees to either retain all test products or samples collected by or submitted to Consultant, or return same to the Owner as mutually agreed upon. In absence of agreement, Consultant shall not dispose of test samples or products without notice to or consent by the Owner or the Owner's representative.

9. **Additional Services** - No compensation shall be paid for any service rendered by the Consultant considered an additional service beyond the scope of services approved by the Owner unless rendition of that service and expense thereof has been authorized in writing by the Owner in advance of performance of such service. Any additional services performed by the Consultant prior to such authorization by the Owner shall be deemed a part of basic services for work performed under an Owner approved proposal for services governed by this agreement, whether enumerated in this agreement or not, for which the Consultant shall be entitled to no additional compensation.

10. **Owner Authorization** -When the term Owner is used in this agreement, it shall mean the government of Boone County, Missouri or the Boone County Commission, as the context requires. Authorization by the Owner shall mean authorization obtained by recorded majority vote of the Boone County Commission. It is further understood and agreed that no person or party is authorized to bind the Owner to any proposed agreement for services under the auspices of this agreement without having obtained the prior approval of the Boone County Commission by recorded majority vote for such authorization. In this regard, it is understood and agreed that the Consultant shall not be entitled to rely upon verbal or written representations by any agent or employee of the Owner in deviation to the terms and conditions of this agreement, or as authorization for compensation for services except as may be approved by recorded vote of the Boone County Commission. When the term Owner's representative is used, it shall mean the Director of the Boone County Resource Management Department or his designee as specified in writing. It shall be presumed that such representative shall have all necessary decision making authority with respect to services provided under this agreement and Owner approved proposals for services except such representative shall have no authority to make decisions concerning changes to the Consultant's compensation or reimbursement, or with respect to services to be performed under this agreement or Owner approved proposal for services which involve or affect cost, expense or budgetary allowances.

11. **Termination** - The Owner may and reserves the right to terminate this agreement at any time with or without cause by giving the Consultant written notice of termination. Upon receipt of such notice, Consultant shall discontinue all services in connection with the performance of services authorized under this agreement or Owner approved proposal for services and Owner shall upon invoice remit payment for all authorized services completed up to the date of termination notice. Upon payment of this invoice, the Consultant shall deliver any and all work product including drawings, plans, and specifications, or other documents, prepared as instruments of service, whether complete or in progress. It is further agreed that if services are terminated the Consultant shall be compensated for all services rendered through the date of termination not to exceed the amount authorized for services through the date of termination. If the Owner questions the extent of work on a final invoice, the Consultant shall give the Owner the opportunity to review and evaluate all work upon which the invoice is based in the offices of the Consultant prior to payment. This agreement or work performed under the provisions of this agreement may also be terminated by the Consultant upon not less than seven days written notice in the event the Owner shall substantially fail to perform in accordance with the terms and conditions of this agreement, through no fault of the Consultant. In the event of termination by the Consultant, the other provisions concerning termination contained in this paragraph shall be applicable.

12. **Governing Law** - This agreement shall be governed by the laws of the state of Missouri and it is agreed that this agreement is made in Boone County, Missouri and that Boone County, Missouri is proper venue for any action pertaining to the interpretation or enforcement of any provision within or services performed under this agreement.

13. **Certification of Lawful Presence / Work Authorization** - Consultant shall complete and return the Work Authorization Certification attached hereto, and if applicable, the other required lawful presence documents for an individual Consultant.

14. **Miscellaneous** - This agreement constitutes the entire agreement of the parties superseding all prior negotiations, written or verbal, and may only be amended by signed writing executed by the parties through their authorized representatives hereunder.

IN WITNESS WHEREOF, the parties have executed this agreement by their duly authorized signatories effective the date and year first-above written.

MALICOAT-WINSLOW ENGINEERS, P.C.

By Fred Malicoat

Title President

Dated: 12-21-18

BOONE COUNTY, MISSOURI

By David K. [Signature]

Presiding Commissioner

Dated: 1-17-19

APPROVED AS TO FORM:

By: [Signature]
County Attorney

ATTEST:

Brianna J. Denron
County Clerk

APPROVED:

[Signature]
Director, Boone County Resource Management

**WORK AUTHORIZATION CERTIFICATION
PURSUANT TO 285.530 RSMo
(FOR ALL AGREEMENTS IN EXCESS OF \$5,000.00)**

County of Boone)
)ss
State of Missouri)

My name is Fred Malicoat . I am an authorized agent of Malicoat - Waslow Engineers (Consultant). This business is enrolled and participates in a federal work authorization program for all employees working in connection with services provided to the County. This business does not knowingly employ any person that is an unauthorized alien in connection with the services being provided. Documentation of participation in a federal work authorization program is attached hereto.

Furthermore, all subcontractors working on this contract shall affirmatively state in writing in their contracts that they are not in violation of Section 285.530.1, shall not thereafter be in violation and submit a sworn affidavit under penalty of perjury that all employees are lawfully present in the United States.

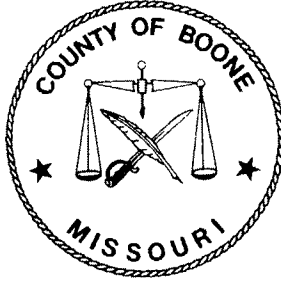
Fred Malicoat 12-21-18
Affiant Date

Fred Malicoat
Printed Name

Subscribed and sworn to before me this 21 day of December, 2018.

Erin Kathleen Pratt
Notary Public





Malicoat-Winslow Engineers,
P.C.

2019 Discipline List

Instructions: Please place a check mark in the Services Offered box next to those disciplines provided by your firm

Discipline	Services Offered
Architecture	
Bridge Design	
Civil Engineering	
Construction Management	
Electrical Engineering	X
Geotechnical Engineering	
Lab Testing	
Mechanical Engineering	X
Planning	
Structural Engineering	
Surveying	
Traffic	
Transportation	
Acoustical	
Building Enclosure Consulting	
Control System Integration	X
Design/Build	
Environmental	
Forensic	
GIS	
Industrial	
Interior Design	
Landscape Architecture	
Natural Gas	
Photogrammetry	
Telecommunications	

Reviewed by: jm

MALICOAT-WINSLOW ENGINEERS, P.C.
MECHANICAL AND ELECTRICAL ENGINEERS

5649 NORTH CLEARVIEW ROAD
COLUMBIA, MISSOURI 65202-9687

FREDDIE L. MALICOAT, P.E
email: fredm@mwengrs.com

Phone: 573-875-1300
Fax: 573-875-1305

HOURLY RATES

PRINCIPAL ENGINEER	\$150/hr
PROFESSIONAL ENGINEER	\$120/hr
ENGINEER-IN-TRAINING	\$90/hr
CADD SUPERVISOR	\$70/hr
CADD TECHNICIAN	\$70/hr
CLERICAL	\$70/hr

GENERAL CONSULTANT SERVICES AGREEMENT

THIS AGREEMENT dated this 17th day of January, ~~2018~~ 2019 by and between Boone County, Missouri, a first class county and political subdivision of the state of Missouri through its County Commission, (herein "Owner") and Allstate Consultants (herein "Consultant").

IN CONSIDERATION OF the performance of the services rendered under this Agreement and payment for such services, the parties agree to the following:

1. **Agreement duration** – This contract shall be in effect beginning January 1, 2019 or the date of full execution; which ever is later and run through the calendar year ending on December 31, 2019. This agreement may be terminated in accordance with the terms and conditions set forth in this agreement.

2. **Services** - As authorized by the Owner in writing, the Consultant shall provide the Owner all engineering, surveying, and other professional services for the benefit of the Owner as prescribed by the Owner based upon requests for proposals for projects assigned during the term of this agreement and the Consultant shall provide the Owner, as applicable, with the services, reports, studies, surveys, plans, specifications, and other work required by the Owner's request for proposal. Consultant agrees to provide all such services in a timely manner as established by the Owner in writing for each assigned project, or in the absence of the designation, within a reasonable time after receipt of Owner directives. Consultant agrees to provide services by and through qualified personnel under standards and conditions generally accepted by professionals in the field or occupations for which services are provided. Services shall be provided based only upon requests for proposals provided to the Consultant by the Owner or Owner's representative and to which the Consultant prepares and submits a written proposal for services which is approved by the Owner in writing. No work shall be performed nor shall compensation be paid for Consultant work performed without an Owner approved written proposal for professional services. Proposals for services shall be in written form, as required by the request for proposal, and shall be specifically responsive to the criteria provided by the Owner in its request for proposal. All work performed by the Consultant, based upon Owner approved proposals submitted by the Consultant, shall be subject to the terms and conditions of this agreement unless otherwise specifically agreed upon by the Owner and Consultant in writing. All proposals for work submitted by the Consultant to the Owner for work shall at a minimum contain the following:

2.1 **Scope of Services** - Each proposal for services shall contain a detailed description of work to be performed by the Consultant. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to the request with the same or greater level of specificity required by the request for proposal. The Consultant shall specifically identify services which are included as basic services and those services which are excluded from basic services in the proposal. Services which the Consultant does not identify as excluded from basic services under the proposal and which are necessary for successful completion of the work in the judgment of the Owner shall be presumed to be a part of basic services under the proposal. If a request for proposal requires the Consultant to provide optional services, the Consultant's proposal shall respond to the options requested, or provide

reasons why the Consultant cannot provide or respond to the request for optional services.

2.2 Time for Completion - Each proposal for services shall contain a detailed description of the estimated time to complete each task or item of work to be performed by the Consultant under the proposal. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to any request for estimated or maximum completion times for work with the same or greater level of specificity required by the request for proposal.

2.3 Compensation - Each proposal for services shall state the basis of compensation on either: (1) an hourly fee plus expense basis with a statement of a maximum compensation to be charged, or, (2) a lump sum payment of compensation for all work to be performed, or, (3) a payment based upon unit prices. Proposals for compensation for an hourly fee plus expense basis shall provide detailed time and expense estimates to support a maximum contract amount to be charged and shall be consistent with the hourly rates, unit prices and reimbursement rates made a part of this agreement by reference in paragraph two (2) below. When the Owner or Owner's representative requests the Consultant to provide work on an hourly fee plus expense basis, the Consultant's proposal shall be responsive to the request and shall not propose payment on another basis unless otherwise authorized. Unit price proposals shall identify and estimate the quantity of units as a part of the proposal when they can be identified and estimated, or as necessary in response to a particular request for proposal requesting such information. Each proposal for services shall also state a proposed payment schedule at a frequency no greater than monthly in such amounts as are consistent with amount of work to be performed and billed. Reimbursable expenses proposed shall be specifically identified and estimated as a part of the proposal with a statement of the maximum amount to be charged unless the Owner's request for proposal specifies otherwise.

2.4 Signatures - Consultant proposals for services under this agreement shall be signed and dated by the Consultant or an authorized representative of the Consultant (as applicable), and shall be considered binding offers to contract open for acceptance by the Owner for an indefinite duration unless limited in the proposal or withdrawn prior to acceptance by the Owner. All proposals for services under this agreement shall be on forms approved by the Owner; use of the signature block shown in this agreement on a proposal for services shall be considered an adequate signature block. In the absence of an Owner provided form, the signature block shall contain a signature line for Boone County, Missouri by its Presiding Commissioner, a signature line for attestation by the County Clerk, a signature line approving the proposal by the Director of Resource Management, and a signature line for the County Attorney approving the proposal as to legal form. In addition, the signature block shall contain a line for insertion of the date the proposal is approved by the Owner.

3. Compensation - In consideration for the Consultant's provision of services under this agreement, the Owner agrees to compensate the Consultant for services rendered in accordance with the hourly rates, unit prices and reimbursement rates for expenses set forth in the schedule for hourly rates and expense charges to be in effect for the calendar year of this agreement which is either attached to this agreement or maintained on file with the Boone County Resource Management Department and is hereby incorporated by reference. No increases in the rates and charges set forth in the attached schedule shall be permitted for this

calendar year without the written authorization of the Owner. Payments shall be made within thirty (30) days of receipt of invoice by the Owner. Invoices shall be submitted periodically as mutually agreed upon by the Owner and Consultant, or in the absence of such agreement, upon completion of the work constituting the task or project for which services are provided. Invoices for services on an hourly fee plus expense basis shall individually describe the task or project by name, show hours expended by classes of personnel in increments of not less than one-half hour and rates applied, as well as describe work performed during the invoice period; reimbursable expenses shall be itemized. Invoices for services performed on a unit price basis shall identify the task or project by name, identify and quantify units charged for services during the invoice period. Invoices for services on a lump sum basis shall identify the task or project by name and the invoiced amount. Periodic invoices shall not exceed the amounts permitted in the Consultant's proposal approved by the Owner. The Owner reserves the right to withhold payment for inadequately documented invoices until documented as required herein. The Owner further reserves the right to withhold payments for unperformed work or work not performed on a timely basis in accordance with the Consultant's proposal when delays in performance of services are not attributable to the Owner, or as a result of a billing dispute between the Owner and Consultant. However, Owner agrees to pay interest at a rate of nine percent (9%) annum on any disputed billed amounts for which payments are withheld beyond thirty (30) days of invoice if and to the extent that those disputed amounts are resolved in favor of the Consultant.

4. **Owner Responsibilities** - Owner agrees to furnish Consultant with all current and available information for each task or project assigned to Consultant, along with any information necessitated by changes in work or services initiated by the Owner which may affect services rendered thereunder.

5. **Coordination of Work and Work Product** - Consultant shall coordinate all work with the Owner's designated representative for each task or project assigned to Consultant and submit to the Owner's representative all work product in written or graphic form (and in electronic form if requested) as applicable or required. All reports, surveys, test data, memoranda, samples, plans, specifications, and other documents or materials submitted by or to the Owner shall be considered the property of the Owner. When available and requested by the Owner, work product shall be provided in electronic form at actual cost in media compatible for use with Owner software and equipment.

6. **Insurance** - Consultant shall procure and maintain professional liability insurance in such amounts as are deemed mutually agreeable to the parties and approved by the Owner or the Owner's representative in writing within thirty (30) days of this Agreement. Consultant shall also maintain general public liability insurance with coverage's no less than \$2,000,000.00 per occurrence, and worker's compensation insurance as required by state law. Failure of Consultant to obtain or maintain such insurance during this contract, or to provide proper proofs thereof upon request of the Owner, shall not diminish, waive or otherwise reduce the Consultant's obligations to maintain such insurance coverage and Consultant shall indemnify and hold the Owner and all its personnel harmless from and against any and all claims, damages, losses and expenses, including reasonable attorney's fees and litigation costs, arising out of or resulting from the performance of services, provided that any such claim, damage, loss or expenses, is caused in whole or in part by the negligent act, omission and or liability of the Consultant, its agents or employees. The Consultant shall provide the Owner with certificates of insurance

exhibiting the coverage as specified above within thirty (30) days of execution of this agreement and thereafter within five (5) working days after request by the Owner. All certificates of insurance shall contain provision that insurance provided shall not be canceled or altered except upon ten (10) days written notice to the Owner.

7. **Delegation and Subcontracting** - Unless otherwise proposed and approved in the Consultant's proposal for services, the Consultant shall not delegate or subcontract any work to be performed by the Consultant under this agreement to any other person, business or entity without the express advance written approval of the Owner for such delegation or subcontract work.

8. **Records and Samples** - To the extent not otherwise transferred to the Owner's possession, Consultant agrees to retain and provide the Owner with reasonable access to all work product, records, papers and other documents involving transactions and work related to or performed under this agreement for a period of three (3) years after this agreement expires. When services involve testing or sampling, Consultant agrees to either retain all test products or samples collected by or submitted to Consultant, or return same to the Owner as mutually agreed upon. In absence of agreement, Consultant shall not dispose of test samples or products without notice to or consent by the Owner or the Owner's representative.

9. **Additional Services** - No compensation shall be paid for any service rendered by the Consultant considered an additional service beyond the scope of services approved by the Owner unless rendition of that service and expense thereof has been authorized in writing by the Owner in advance of performance of such service. Any additional services performed by the Consultant prior to such authorization by the Owner shall be deemed a part of basic services for work performed under an Owner approved proposal for services governed by this agreement, whether enumerated in this agreement or not, for which the Consultant shall be entitled to no additional compensation.

10. **Owner Authorization** -When the term Owner is used in this agreement, it shall mean the government of Boone County, Missouri or the Boone County Commission, as the context requires. Authorization by the Owner shall mean authorization obtained by recorded majority vote of the Boone County Commission. It is further understood and agreed that no person or party is authorized to bind the Owner to any proposed agreement for services under the auspices of this agreement without having obtained the prior approval of the Boone County Commission by recorded majority vote for such authorization. In this regard, it is understood and agreed that the Consultant shall not be entitled to rely upon verbal or written representations by any agent or employee of the Owner in deviation to the terms and conditions of this agreement, or as authorization for compensation for services except as may be approved by recorded vote of the Boone County Commission. When the term Owner's representative is used, it shall mean the Director of the Boone County Resource Management Department or his designee as specified in writing. It shall be presumed that such representative shall have all necessary decision making authority with respect to services provided under this agreement and Owner approved proposals for services except such representative shall have no authority to make decisions concerning changes to the Consultant's compensation or reimbursement, or with respect to services to be performed under this agreement or Owner approved proposal for services which involve or affect cost, expense or budgetary allowances.

11. **Termination** - The Owner may and reserves the right to terminate this agreement at any time with or without cause by giving the Consultant written notice of termination. Upon receipt of such notice, Consultant shall discontinue all services in connection with the performance of services authorized under this agreement or Owner approved proposal for services and Owner shall upon invoice remit payment for all authorized services completed up to the date of termination notice. Upon payment of this invoice, the Consultant shall deliver any and all work product including drawings, plans, and specifications, or other documents, prepared as instruments of service, whether complete or in progress. It is further agreed that if services are terminated the Consultant shall be compensated for all services rendered through the date of termination not to exceed the amount authorized for services through the date of termination. If the Owner questions the extent of work on a final invoice, the Consultant shall give the Owner the opportunity to review and evaluate all work upon which the invoice is based in the offices of the Consultant prior to payment. This agreement or work performed under the provisions of this agreement may also be terminated by the Consultant upon not less than seven days written notice in the event the Owner shall substantially fail to perform in accordance with the terms and conditions of this agreement, through no fault of the Consultant. In the event of termination by the Consultant, the other provisions concerning termination contained in this paragraph shall be applicable.

12. **Governing Law** - This agreement shall be governed by the laws of the state of Missouri and it is agreed that this agreement is made in Boone County, Missouri and that Boone County, Missouri is proper venue for any action pertaining to the interpretation or enforcement of any provision within or services performed under this agreement.

13. **Certification of Lawful Presence / Work Authorization** - Consultant shall complete and return the Work Authorization Certification attached hereto, and if applicable, the other required lawful presence documents for an individual Consultant.

14. **Miscellaneous** - This agreement constitutes the entire agreement of the parties superseding all prior negotiations, written or verbal, and may only be amended by signed writing executed by the parties through their authorized representatives hereunder.

IN WITNESS WHEREOF, the parties have executed this agreement by their duly authorized signatories effective the date and year first-above written.

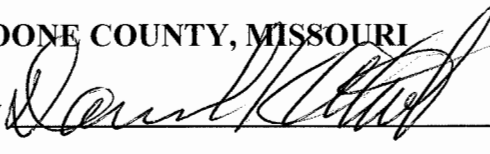
ALLSTATE CONSULTANTS

By 

Title President

Dated: 12/26/2018

BOONE COUNTY, MISSOURI

By 


Presiding Commissioner

Dated: 1.17.19

APPROVED AS TO FORM:


County Attorney

ATTEST:


County Clerk

APPROVED:


Director, Boone County Resource Management




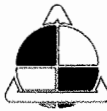
Allstate Consultants

2019 Discipline List

Instructions: Please place a check mark in the Services Offered box next to those disciplines provided by your firm

Discipline	Services Offered
Architecture	
Bridge Design	
Civil Engineering	✓
Construction Management	✓
Electrical Engineering	
Geotechnical Engineering	✓
Lab Testing	✓
Mechanical Engineering	
Planning	✓
Structural Engineering	✓
Surveying	✓
Traffic	✓
Transportation	✓
Acoustical	
Building Enclosure Consulting	✓
Control System Integration	
Design/Build	✓
Environmental	✓
Forensic	✓
GIS	✓
Industrial	
Interior Design	
Landscape Architecture	
Natural Gas	
Photogrammetry	
Telecommunications	
Water Resources	✓

Reviewed by: 



**ALLSTATE
CONSULTANTS**

2019 Rate Schedule

<u>TITLE</u>	<u>RATE</u>
PRINCIPAL.....	\$175.00
ENGINEER III	\$145.00
ENGINEER II.....	\$135.00
ENGINEER I.....	\$121.00
WATER QUALITY SCIENTIST III	\$140.00
WATER QUALITY SCIENTIST II	\$110.00
WATER QUALITY SCIENTIST I	\$70.00
PROJECT SCIENTIST III.....	\$135.00
INVESTIGATIVE ENGINEER III	\$215.00
INVESTIGATIVE ENGINEER II.....	\$190.00
INVESTIGATIVE ENGINEER I	\$165.00
TECHNICIAN VI/SURVEYOR III	\$128.00
TECHNICIAN V/SURVEYOR II	\$118.00
TECHNICIAN IV/SURVEYOR I/SENIOR PROJECT MANAGER.....	\$103.00
TECHNICIAN III/ PROJECT MANAGER I.....	\$88.00
TECHNICIAN II	\$72.00
TECHNICIAN I.....	\$52.00
TECHNICIAN	\$35.00
SURVEY CREW (1 MAN).....	\$128.00
SURVEY CREW (2 MEN).....	\$155.00
SURVEY CREW (3 MEN).....	\$180.00
INVESTIGATOR IV	\$125.00
INVESTIGATOR III	\$115.00
INVESTIGATOR II.....	\$90.00
INVESTIGATOR I.....	\$75.00
EXPERT TESTIMONY II.....	\$350.00
EXPERT TESTIMONY I.....	\$225.00
DRILL RIG CREW (2 MEN)	\$160.00
DRILL RIG CREW WITH GROUTER (2 MEN)	180.00
GPS RECEIVERS/DRONE (PER UNIT)	\$125.00/day
TRAFFIC COUNTERS (PER UNIT).....	\$50.00/day
ATV (PER UNIT).....	\$125.00/day
MILEAGE	IRS Rate
EXPENSES (Lodging, Meals, Printing, Research, & etc.).....	Actual Cost

3312 LeMone Industrial Boulevard
Columbia, Missouri 65201
Phone: 573-875-8799
Fax: 573-875-8850
Allstate/files/allstate/wage rates

900 SW Oldham Pkwy
Suite 203
Lee's Summit, MO 64081
573-864-9323

30601 Highway 5
Marceline, Missouri 64658
Phone: 660-376-2941
Fax: 660-376-3492

GEOTECHNICAL AND CONSTRUCTION OBSERVATION AND TESTING SERVICES

SUBSURFACE EXPLORATION

Mobilization of Truck Mounted Drill Rig and 2-Man Crew.....	\$160/hour
Mobilization of ATV Mounted Drill Rig and 2-Man Crew.....	\$3.00/mile
Mobilization of Water Truck or Support Vehicle	\$1.25/mile
Drilling and Sampling Using Thin-walled Tubes and/or Split Barrel Samplers in Soil & NX Coring in Rock (Truck Mounted Drill and 2-Man Crew).....	\$160/hour
Drilling and Sampling Using Thin-walled Tubes and/or Split Barrel Samplers in Soil & NX Coring in Rock (ATV Mounted Drill and 2-Man Crew).....	Actual Cost
ATV Mounted Drill Rig Surcharge (If Any).....	Actual Cost
Specialized In-Situ Tests.....	On Request
Subcontractors, Rentals, Supplies and Dozer Assistance	Actual Cost
For Actual Cost of Sub Contracted Items	See Attached

LABORATORY TESTING SERVICES

Moisture Content	\$6.00/test
Dry Unit Weight	\$15.00/test
Unconfined Compressive Strength.....	\$35.00/test
With Stress vs. Strain Curve	\$60.00/test
Extrude Shelby Tube.....	\$10.00/each
Calibrated Penetrometer Test	\$4.00/test
Visual Soil Classification.....	\$5.00/test
Atterberg Limits (3 Pt. Liquid Limit).....	\$100.00/test
Sieve Analysis (with wet wash over No. 200 sieve)	\$100.00/test
Hydrometer Analysis	\$110.00/test
Combined Grain Size Analysis (Sieve and Hydrometer)	\$220.00/test
Specific Gravity Determination	\$80.00/test
Swell Potential (1 Surcharge Pressure)	\$200.00/test
Swell Potential and Swell Pressure	\$300.00/test
Consolidation Test with e log p Curve.....	\$525.00/test
With Time vs. Deformation Plots	\$50.00/plot
Standard Proctor Test.....	\$175.00/test
Modified Proctor Test	\$250.00/test
Laboratory CBR Test (Per Specimen).....	\$250.00/test
Concrete Compressive Strength Tests.....	\$20.00/test
Capping or Trimming Irregular Ends of Concrete Cylinders	\$10.00/each
Concrete Flexural Strength Tests	\$50.00/test
Other Specialized Tests (Triaxial Shear, Direct Shear, Hydraulic Conductivity etc.).....	Actual Cost

3312 LeMone Industrial Boulevard
Columbia, Missouri 65201
Phone: 573-875-8799
Fax: 573-875-8850

900 SW Oldham Pkwy
Suite 203
Lee's Summit, MO 64081
573-864-9323

30601 Highway 5
Marceline, Missouri 64658
Phone: 660-376-2941
Fax: 660-376-3492

GENERAL CONSULTANT SERVICES AGREEMENT

THIS AGREEMENT dated this 17th day of January, ~~2018~~ 2019 by and between Boone County, Missouri, a first class county and political subdivision of the state of Missouri through its County Commission, (herein "Owner") and CFS Engineers (herein "Consultant").

IN CONSIDERATION OF the performance of the services rendered under this Agreement and payment for such services, the parties agree to the following:

1. **Agreement duration** – This contract shall be in effect beginning January 1, 2019 or the date of full execution; which ever is later and run through the calendar year ending on December 31, 2019. This agreement may be terminated in accordance with the terms and conditions set forth in this agreement.

2. **Services** - As authorized by the Owner in writing, the Consultant shall provide the Owner all engineering, surveying, and other professional services for the benefit of the Owner as prescribed by the Owner based upon requests for proposals for projects assigned during the term of this agreement and the Consultant shall provide the Owner, as applicable, with the services, reports, studies, surveys, plans, specifications, and other work required by the Owner's request for proposal. Consultant agrees to provide all such services in a timely manner as established by the Owner in writing for each assigned project, or in the absence of the designation, within a reasonable time after receipt of Owner directives. Consultant agrees to provide services by and through qualified personnel under standards and conditions generally accepted by professionals in the field or occupations for which services are provided. Services shall be provided based only upon requests for proposals provided to the Consultant by the Owner or Owner's representative and to which the Consultant prepares and submits a written proposal for services which is approved by the Owner in writing. No work shall be performed nor shall compensation be paid for Consultant work performed without an Owner approved written proposal for professional services. Proposals for services shall be in written form, as required by the request for proposal, and shall be specifically responsive to the criteria provided by the Owner in its request for proposal. All work performed by the Consultant, based upon Owner approved proposals submitted by the Consultant, shall be subject to the terms and conditions of this agreement unless otherwise specifically agreed upon by the Owner and Consultant in writing. All proposals for work submitted by the Consultant to the Owner for work shall at a minimum contain the following:

2.1 **Scope of Services** - Each proposal for services shall contain a detailed description of work to be performed by the Consultant. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to the request with the same or greater level of specificity required by the request for proposal. The Consultant shall specifically identify services which are included as basic services and those services which are excluded from basic services in the proposal. Services which the Consultant does not identify as excluded from basic services under the proposal and which are necessary for successful completion of the work in the judgment of the Owner shall be presumed to be a part of basic services under the proposal. If a request for proposal requires the Consultant to provide optional services, the Consultant's proposal shall respond to the options requested, or provide

reasons why the Consultant cannot provide or respond to the request for optional services.

2.2 **Time for Completion** - Each proposal for services shall contain a detailed description of the estimated time to complete each task or item of work to be performed by the Consultant under the proposal. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to any request for estimated or maximum completion times for work with the same or greater level of specificity required by the request for proposal.

2.3 **Compensation** - Each proposal for services shall state the basis of compensation on either: (1) an hourly fee plus expense basis with a statement of a maximum compensation to be charged, or, (2) a lump sum payment of compensation for all work to be performed, or, (3) a payment based upon unit prices. Proposals for compensation for an hourly fee plus expense basis shall provide detailed time and expense estimates to support a maximum contract amount to be charged and shall be consistent with the hourly rates, unit prices and reimbursement rates made a part of this agreement by reference in paragraph two (2) below. When the Owner or Owner's representative requests the Consultant to provide work on an hourly fee plus expense basis, the Consultant's proposal shall be responsive to the request and shall not propose payment on another basis unless otherwise authorized. Unit price proposals shall identify and estimate the quantity of units as a part of the proposal when they can be identified and estimated, or as necessary in response to a particular request for proposal requesting such information. Each proposal for services shall also state a proposed payment schedule at a frequency no greater than monthly in such amounts as are consistent with amount of work to be performed and billed. Reimbursable expenses proposed shall be specifically identified and estimated as a part of the proposal with a statement of the maximum amount to be charged unless the Owner's request for proposal specifies otherwise.

2.4 **Signatures** - Consultant proposals for services under this agreement shall be signed and dated by the Consultant or an authorized representative of the Consultant (as applicable), and shall be considered binding offers to contract open for acceptance by the Owner for an indefinite duration unless limited in the proposal or withdrawn prior to acceptance by the Owner. All proposals for services under this agreement shall be on forms approved by the Owner; use of the signature block shown in this agreement on a proposal for services shall be considered an adequate signature block. In the absence of an Owner provided form, the signature block shall contain a signature line for Boone County, Missouri by its Presiding Commissioner, a signature line for attestation by the County Clerk, a signature line approving the proposal by the Director of Resource Management, and a signature line for the County Attorney approving the proposal as to legal form. In addition, the signature block shall contain a line for insertion of the date the proposal is approved by the Owner.

3. **Compensation** - In consideration for the Consultant's provision of services under this agreement, the Owner agrees to compensate the Consultant for services rendered in accordance with the hourly rates, unit prices and reimbursement rates for expenses set forth in the schedule for hourly rates and expense charges to be in effect for the calendar year of this agreement which is either attached to this agreement or maintained on file with the Boone County Resource Management Department and is hereby incorporated by reference. No increases in the rates and charges set forth in the attached schedule shall be permitted for this

calendar year without the written authorization of the Owner. Payments shall be made within thirty (30) days of receipt of invoice by the Owner. Invoices shall be submitted periodically as mutually agreed upon by the Owner and Consultant, or in the absence of such agreement, upon completion of the work constituting the task or project for which services are provided. Invoices for services on an hourly fee plus expense basis shall individually describe the task or project by name, show hours expended by classes of personnel in increments of not less than one-half hour and rates applied, as well as describe work performed during the invoice period; reimbursable expenses shall be itemized. Invoices for services performed on a unit price basis shall identify the task or project by name, identify and quantify units charged for services during the invoice period. Invoices for services on a lump sum basis shall identify the task or project by name and the invoiced amount. Periodic invoices shall not exceed the amounts permitted in the Consultant's proposal approved by the Owner. The Owner reserves the right to withhold payment for inadequately documented invoices until documented as required herein. The Owner further reserves the right to withhold payments for unperformed work or work not performed on a timely basis in accordance with the Consultant's proposal when delays in performance of services are not attributable to the Owner, or as a result of a billing dispute between the Owner and Consultant. However, Owner agrees to pay interest at a rate of nine percent (9%) annum on any disputed billed amounts for which payments are withheld beyond thirty (30) days of invoice if and to the extent that those disputed amounts are resolved in favor of the Consultant.

4. **Owner Responsibilities** - Owner agrees to furnish Consultant with all current and available information for each task or project assigned to Consultant, along with any information necessitated by changes in work or services initiated by the Owner which may affect services rendered thereunder.

5. **Coordination of Work and Work Product** - Consultant shall coordinate all work with the Owner's designated representative for each task or project assigned to Consultant and submit to the Owner's representative all work product in written or graphic form (and in electronic form if requested) as applicable or required. All reports, surveys, test data, memoranda, samples, plans, specifications, and other documents or materials submitted by or to the Owner shall be considered the property of the Owner. When available and requested by the Owner, work product shall be provided in electronic form at actual cost in media compatible for use with Owner software and equipment.

6. **Insurance** - Consultant shall procure and maintain professional liability insurance in such amounts as are deemed mutually agreeable to the parties and approved by the Owner or the Owner's representative in writing within thirty (30) days of this Agreement. Consultant shall also maintain general public liability insurance with coverage's no less than \$2,000,000.00 per occurrence, and worker's compensation insurance as required by state law. Failure of Consultant to obtain or maintain such insurance during this contract, or to provide proper proofs thereof upon request of the Owner, shall not diminish, waive or otherwise reduce the Consultant's obligations to maintain such insurance coverage and Consultant shall indemnify and hold the Owner and all its personnel harmless from and against any and all claims, damages, losses and expenses, including reasonable attorney's fees and litigation costs, arising out of or resulting from the performance of services, provided that any such claim, damage, loss or expenses, is caused in whole or in part by the negligent act, omission and or liability of the Consultant, its agents or employees. The Consultant shall provide the Owner with certificates of insurance

exhibiting the coverage as specified above within thirty (30) days of execution of this agreement and thereafter within five (5) working days after request by the Owner. All certificates of insurance shall contain provision that insurance provided shall not be canceled or altered except upon ten (10) days written notice to the Owner.

7. **Delegation and Subcontracting** - Unless otherwise proposed and approved in the Consultant's proposal for services, the Consultant shall not delegate or subcontract any work to be performed by the Consultant under this agreement to any other person, business or entity without the express advance written approval of the Owner for such delegation or subcontract work.

8. **Records and Samples** - To the extent not otherwise transferred to the Owner's possession, Consultant agrees to retain and provide the Owner with reasonable access to all work product, records, papers and other documents involving transactions and work related to or performed under this agreement for a period of three (3) years after this agreement expires. When services involve testing or sampling, Consultant agrees to either retain all test products or samples collected by or submitted to Consultant, or return same to the Owner as mutually agreed upon. In absence of agreement, Consultant shall not dispose of test samples or products without notice to or consent by the Owner or the Owner's representative.

9. **Additional Services** - No compensation shall be paid for any service rendered by the Consultant considered an additional service beyond the scope of services approved by the Owner unless rendition of that service and expense thereof has been authorized in writing by the Owner in advance of performance of such service. Any additional services performed by the Consultant prior to such authorization by the Owner shall be deemed a part of basic services for work performed under an Owner approved proposal for services governed by this agreement, whether enumerated in this agreement or not, for which the Consultant shall be entitled to no additional compensation.

10. **Owner Authorization** - When the term Owner is used in this agreement, it shall mean the government of Boone County, Missouri or the Boone County Commission, as the context requires. Authorization by the Owner shall mean authorization obtained by recorded majority vote of the Boone County Commission. It is further understood and agreed that no person or party is authorized to bind the Owner to any proposed agreement for services under the auspices of this agreement without having obtained the prior approval of the Boone County Commission by recorded majority vote for such authorization. In this regard, it is understood and agreed that the Consultant shall not be entitled to rely upon verbal or written representations by any agent or employee of the Owner in deviation to the terms and conditions of this agreement, or as authorization for compensation for services except as may be approved by recorded vote of the Boone County Commission. When the term Owner's representative is used, it shall mean the Director of the Boone County Resource Management Department or his designee as specified in writing. It shall be presumed that such representative shall have all necessary decision making authority with respect to services provided under this agreement and Owner approved proposals for services except such representative shall have no authority to make decisions concerning changes to the Consultant's compensation or reimbursement, or with respect to services to be performed under this agreement or Owner approved proposal for services which involve or affect cost, expense or budgetary allowances.

11. **Termination** - The Owner may and reserves the right to terminate this agreement at any time with or without cause by giving the Consultant written notice of termination. Upon receipt of such notice, Consultant shall discontinue all services in connection with the performance of services authorized under this agreement or Owner approved proposal for services and Owner shall upon invoice remit payment for all authorized services completed up to the date of termination notice. Upon payment of this invoice, the Consultant shall deliver any and all work product including drawings, plans, and specifications, or other documents, prepared as instruments of service, whether complete or in progress. It is further agreed that if services are terminated the Consultant shall be compensated for all services rendered through the date of termination not to exceed the amount authorized for services through the date of termination. If the Owner questions the extent of work on a final invoice, the Consultant shall give the Owner the opportunity to review and evaluate all work upon which the invoice is based in the offices of the Consultant prior to payment. This agreement or work performed under the provisions of this agreement may also be terminated by the Consultant upon not less than seven days written notice in the event the Owner shall substantially fail to perform in accordance with the terms and conditions of this agreement, through no fault of the Consultant. In the event of termination by the Consultant, the other provisions concerning termination contained in this paragraph shall be applicable.

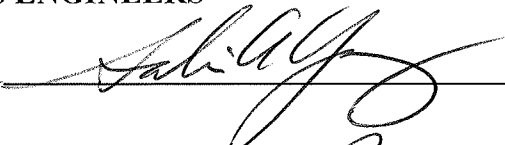
12. **Governing Law** - This agreement shall be governed by the laws of the state of Missouri and it is agreed that this agreement is made in Boone County, Missouri and that Boone County, Missouri is proper venue for any action pertaining to the interpretation or enforcement of any provision within or services performed under this agreement.

13. **Certification of Lawful Presence / Work Authorization** - Consultant shall complete and return the Work Authorization Certification attached hereto, and if applicable, the other required lawful presence documents for an individual Consultant.

14. **Miscellaneous** - This agreement constitutes the entire agreement of the parties superseding all prior negotiations, written or verbal, and may only be amended by signed writing executed by the parties through their authorized representatives hereunder.

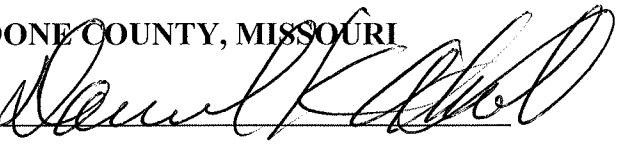
IN WITNESS WHEREOF, the parties have executed this agreement by their duly authorized signatories effective the date and year first-above written.

CFS ENGINEERS

By 
Title Senior Vice President

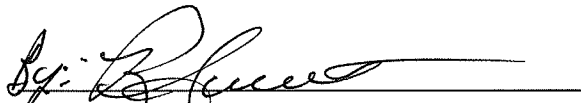
Dated: 1/2/19

BOONE COUNTY, MISSOURI

By 
Presiding Commissioner

Dated: 1.17.19

APPROVED AS TO FORM:


County Attorney

ATTEST:

Brianna J. Lennon
County Clerk

APPROVED:


Director, Boone County Resource Management

**WORK AUTHORIZATION CERTIFICATION
PURSUANT TO 285.530 RSMo
(FOR ALL AGREEMENTS IN EXCESS OF \$5,000.00)**

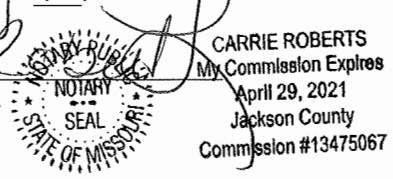
County of Jackson)
State of Missouri)^{ss}

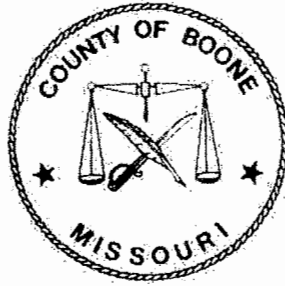
My name is Sabin Yanez I am an authorized agent of CFE Engineers (Consultant). This business is enrolled and participates in a federal work authorization program for all employees working in connection with services provided to the County. This business does not knowingly employ any person that is an unauthorized alien in connection with the services being provided. Documentation of participation in a federal work authorization program is attached hereto.

Furthermore, all subcontractors working on this contract shall affirmatively state in writing in their contracts that they are not in violation of Section 285.530.1, shall not thereafter be in violation and submit a sworn affidavit under penalty of perjury that all employees are lawfully present in the United States.

[Signature] 1/2/19
Affiant Date
SABIN ANDREW YANEZ
Printed Name

Subscribed and sworn to before me this 2 day of January 2019

[Signature]
Notary Public


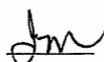


CFS Engineers

2019 Discipline List

Instructions: Please place a check mark in the Services Offered box next to those disciplines provided by your firm

Discipline	Services Offered
Architecture	
Bridge Design	✓
Civil Engineering	✓
Construction Management	✓
Electrical Engineering	
Geotechnical Engineering	✓
Lab Testing	
Mechanical Engineering	
Planning	✓
Structural Engineering	
Surveying	✓
Traffic	✓
Transportation	✓
Acoustical	
Building Enclosure Consulting	
Control System Integration	
Design/Build	✓
Environmental	
Forensic	
GIS	
Industrial	
Interior Design	
Landscape Architecture	✓
Natural Gas	
Photogrammetry	
Telecommunications	

Reviewed by: 



ENGINEERS

2019 Rate Sheet

Civil Principal - \$205
Project Manager \$160
Senior Engineer \$139
Project Engineer \$108
Senior Technician \$98
Licensed Surveyor \$103
2-Man Crew \$130

GENERAL CONSULTANT SERVICES AGREEMENT

THIS AGREEMENT dated this 17th day of January, ~~2018~~ 2019, by and between Boone County, Missouri, a first class county and political subdivision of the state of Missouri through its County Commission, (herein "Owner") and Engineering Surveys and Services, LLC (herein "Consultant").

IN CONSIDERATION OF the performance of the services rendered under this Agreement and payment for such services, the parties agree to the following:

1. **Agreement duration** – This contract shall be in effect beginning January 1, 2019 or the date of full execution; which ever is later and run through the calendar year ending on December 31, 2019. This agreement may be terminated in accordance with the terms and conditions set forth in this agreement.

2. **Services** - As authorized by the Owner in writing, the Consultant shall provide the Owner all engineering, surveying, and other professional services for the benefit of the Owner as prescribed by the Owner based upon requests for proposals for projects assigned during the term of this agreement and the Consultant shall provide the Owner, as applicable, with the services, reports, studies, surveys, plans, specifications, and other work required by the Owner's request for proposal. Consultant agrees to provide all such services in a timely manner as established by the Owner in writing for each assigned project, or in the absence of the designation, within a reasonable time after receipt of Owner directives. Consultant agrees to provide services by and through qualified personnel under standards and conditions generally accepted by professionals in the field or occupations for which services are provided. Services shall be provided based only upon requests for proposals provided to the Consultant by the Owner or Owner's representative and to which the Consultant prepares and submits a written proposal for services which is approved by the Owner in writing. No work shall be performed nor shall compensation be paid for Consultant work performed without an Owner approved written proposal for professional services. Proposals for services shall be in written form, as required by the request for proposal, and shall be specifically responsive to the criteria provided by the Owner in its request for proposal. All work performed by the Consultant, based upon Owner approved proposals submitted by the Consultant, shall be subject to the terms and conditions of this agreement unless otherwise specifically agreed upon by the Owner and Consultant in writing. All proposals for work submitted by the Consultant to the Owner for work shall at a minimum contain the following:

2.1 **Scope of Services** - Each proposal for services shall contain a detailed description of work to be performed by the Consultant. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to the request with the same or greater level of specificity required by the request for proposal. The Consultant shall specifically identify services which are included as basic services and those services which are excluded from basic services in the proposal. Services which the Consultant does not identify as excluded from basic services under the proposal and which are necessary for successful completion of the work in the judgment of the Owner shall be presumed to be a part of basic services under the proposal. If a request for proposal requires the Consultant to provide optional services, the Consultant's proposal shall respond to the options requested, or provide

reasons why the Consultant cannot provide or respond to the request for optional services.

2.2 **Time for Completion** - Each proposal for services shall contain a detailed description of the estimated time to complete each task or item of work to be performed by the Consultant under the proposal. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to any request for estimated or maximum completion times for work with the same or greater level of specificity required by the request for proposal.

2.3 **Compensation** - Each proposal for services shall state the basis of compensation on either: (1) an hourly fee plus expense basis with a statement of a maximum compensation to be charged, or, (2) a lump sum payment of compensation for all work to be performed, or, (3) a payment based upon unit prices. Proposals for compensation for an hourly fee plus expense basis shall provide detailed time and expense estimates to support a maximum contract amount to be charged and shall be consistent with the hourly rates, unit prices and reimbursement rates made a part of this agreement by reference in paragraph two (2) below. When the Owner or Owner's representative requests the Consultant to provide work on an hourly fee plus expense basis, the Consultant's proposal shall be responsive to the request and shall not propose payment on another basis unless otherwise authorized. Unit price proposals shall identify and estimate the quantity of units as a part of the proposal when they can be identified and estimated, or as necessary in response to a particular request for proposal requesting such information. Each proposal for services shall also state a proposed payment schedule at a frequency no greater than monthly in such amounts as are consistent with amount of work to be performed and billed. Reimbursable expenses proposed shall be specifically identified and estimated as a part of the proposal with a statement of the maximum amount to be charged unless the Owner's request for proposal specifies otherwise.

2.4 **Signatures** - Consultant proposals for services under this agreement shall be signed and dated by the Consultant or an authorized representative of the Consultant (as applicable), and shall be considered binding offers to contract open for acceptance by the Owner for an indefinite duration unless limited in the proposal or withdrawn prior to acceptance by the Owner. All proposals for services under this agreement shall be on forms approved by the Owner; use of the signature block shown in this agreement on a proposal for services shall be considered an adequate signature block. In the absence of an Owner provided form, the signature block shall contain a signature line for Boone County, Missouri by its Presiding Commissioner, a signature line for attestation by the County Clerk, a signature line approving the proposal by the Director of Resource Management, and a signature line for the County Attorney approving the proposal as to legal form. In addition, the signature block shall contain a line for insertion of the date the proposal is approved by the Owner.

3. **Compensation** - In consideration for the Consultant's provision of services under this agreement, the Owner agrees to compensate the Consultant for services rendered in accordance with the hourly rates, unit prices and reimbursement rates for expenses set forth in the schedule for hourly rates and expense charges to be in effect for the calendar year of this agreement which is either attached to this agreement or maintained on file with the Boone County Resource Management Department and is hereby incorporated by reference. No increases in the rates and charges set forth in the attached schedule shall be permitted for this

calendar year without the written authorization of the Owner. Payments shall be made within thirty (30) days of receipt of invoice by the Owner. Invoices shall be submitted periodically as mutually agreed upon by the Owner and Consultant, or in the absence of such agreement, upon completion of the work constituting the task or project for which services are provided. Invoices for services on an hourly fee plus expense basis shall individually describe the task or project by name, show hours expended by classes of personnel in increments of not less than one-half hour and rates applied, as well as describe work performed during the invoice period; reimbursable expenses shall be itemized. Invoices for services performed on a unit price basis shall identify the task or project by name, identify and quantify units charged for services during the invoice period. Invoices for services on a lump sum basis shall identify the task or project by name and the invoiced amount. Periodic invoices shall not exceed the amounts permitted in the Consultant's proposal approved by the Owner. The Owner reserves the right to withhold payment for inadequately documented invoices until documented as required herein. The Owner further reserves the right to withhold payments for unperformed work or work not performed on a timely basis in accordance with the Consultant's proposal when delays in performance of services are not attributable to the Owner, or as a result of a billing dispute between the Owner and Consultant. However, Owner agrees to pay interest at a rate of nine percent (9%) annum on any disputed billed amounts for which payments are withheld beyond thirty (30) days of invoice if and to the extent that those disputed amounts are resolved in favor of the Consultant.

4. **Owner Responsibilities** - Owner agrees to furnish Consultant with all current and available information for each task or project assigned to Consultant, along with any information necessitated by changes in work or services initiated by the Owner which may affect services rendered thereunder.

5. **Coordination of Work and Work Product** - Consultant shall coordinate all work with the Owner's designated representative for each task or project assigned to Consultant and submit to the Owner's representative all work product in written or graphic form (and in electronic form if requested) as applicable or required. All reports, surveys, test data, memoranda, samples, plans, specifications, and other documents or materials submitted by or to the Owner shall be considered the property of the Owner. When available and requested by the Owner, work product shall be provided in electronic form at actual cost in media compatible for use with Owner software and equipment.

6. **Insurance** - Consultant shall procure and maintain professional liability insurance in such amounts as are deemed mutually agreeable to the parties and approved by the Owner or the Owner's representative in writing within thirty (30) days of this Agreement. Consultant shall also maintain general public liability insurance with coverage's no less than \$2,000,000.00 per occurrence, and worker's compensation insurance as required by state law. Failure of Consultant to obtain or maintain such insurance during this contract, or to provide proper proofs thereof upon request of the Owner, shall not diminish, waive or otherwise reduce the Consultant's obligations to maintain such insurance coverage and Consultant shall indemnify and hold the Owner and all its personnel harmless from and against any and all claims, damages, losses and expenses, including reasonable attorney's fees and litigation costs, arising out of or resulting from the performance of services, provided that any such claim, damage, loss or expenses, is caused in whole or in part by the negligent act, omission and or liability of the Consultant, its agents or employees. The Consultant shall provide the Owner with certificates of insurance

exhibiting the coverage as specified above within thirty (30) days of execution of this agreement and thereafter within five (5) working days after request by the Owner. All certificates of insurance shall contain provision that insurance provided shall not be canceled or altered except upon ten (10) days written notice to the Owner.

7. **Delegation and Subcontracting** - Unless otherwise proposed and approved in the Consultant's proposal for services, the Consultant shall not delegate or subcontract any work to be performed by the Consultant under this agreement to any other person, business or entity without the express advance written approval of the Owner for such delegation or subcontract work.

8. **Records and Samples** - To the extent not otherwise transferred to the Owner's possession, Consultant agrees to retain and provide the Owner with reasonable access to all work product, records, papers and other documents involving transactions and work related to or performed under this agreement for a period of three (3) years after this agreement expires. When services involve testing or sampling, Consultant agrees to either retain all test products or samples collected by or submitted to Consultant, or return same to the Owner as mutually agreed upon. In absence of agreement, Consultant shall not dispose of test samples or products without notice to or consent by the Owner or the Owner's representative.

9. **Additional Services** - No compensation shall be paid for any service rendered by the Consultant considered an additional service beyond the scope of services approved by the Owner unless rendition of that service and expense thereof has been authorized in writing by the Owner in advance of performance of such service. Any additional services performed by the Consultant prior to such authorization by the Owner shall be deemed a part of basic services for work performed under an Owner approved proposal for services governed by this agreement, whether enumerated in this agreement or not, for which the Consultant shall be entitled to no additional compensation.

10. **Owner Authorization** -When the term Owner is used in this agreement, it shall mean the government of Boone County, Missouri or the Boone County Commission, as the context requires. Authorization by the Owner shall mean authorization obtained by recorded majority vote of the Boone County Commission. It is further understood and agreed that no person or party is authorized to bind the Owner to any proposed agreement for services under the auspices of this agreement without having obtained the prior approval of the Boone County Commission by recorded majority vote for such authorization. In this regard, it is understood and agreed that the Consultant shall not be entitled to rely upon verbal or written representations by any agent or employee of the Owner in deviation to the terms and conditions of this agreement, or as authorization for compensation for services except as may be approved by recorded vote of the Boone County Commission. When the term Owner's representative is used, it shall mean the Director of the Boone County Resource Management Department or his designee as specified in writing. It shall be presumed that such representative shall have all necessary decision making authority with respect to services provided under this agreement and Owner approved proposals for services except such representative shall have no authority to make decisions concerning changes to the Consultant's compensation or reimbursement, or with respect to services to be performed under this agreement or Owner approved proposal for services which involve or affect cost, expense or budgetary allowances.

11. **Termination** - The Owner may and reserves the right to terminate this agreement at any time with or without cause by giving the Consultant written notice of termination. Upon receipt of such notice, Consultant shall discontinue all services in connection with the performance of services authorized under this agreement or Owner approved proposal for services and Owner shall upon invoice remit payment for all authorized services completed up to the date of termination notice. Upon payment of this invoice, the Consultant shall deliver any and all work product including drawings, plans, and specifications, or other documents, prepared as instruments of service, whether complete or in progress. It is further agreed that if services are terminated the Consultant shall be compensated for all services rendered through the date of termination not to exceed the amount authorized for services through the date of termination. If the Owner questions the extent of work on a final invoice, the Consultant shall give the Owner the opportunity to review and evaluate all work upon which the invoice is based in the offices of the Consultant prior to payment. This agreement or work performed under the provisions of this agreement may also be terminated by the Consultant upon not less than seven days written notice in the event the Owner shall substantially fail to perform in accordance with the terms and conditions of this agreement, through no fault of the Consultant. In the event of termination by the Consultant, the other provisions concerning termination contained in this paragraph shall be applicable.

12. **Governing Law** - This agreement shall be governed by the laws of the state of Missouri and it is agreed that this agreement is made in Boone County, Missouri and that Boone County, Missouri is proper venue for any action pertaining to the interpretation or enforcement of any provision within or services performed under this agreement.

13. **Certification of Lawful Presence / Work Authorization** - Consultant shall complete and return the Work Authorization Certification attached hereto, and if applicable, the other required lawful presence documents for an individual Consultant.

14. **Miscellaneous** - This agreement constitutes the entire agreement of the parties superseding all prior negotiations, written or verbal, and may only be amended by signed writing executed by the parties through their authorized representatives hereunder.

IN WITNESS WHEREOF, the parties have executed this agreement by their duly authorized signatories effective the date and year first-above written.

ENGINEERING SURVEYS AND SERVICES, LLC BOONE COUNTY, MISSOURI

By Thom A. Kamann

By [Signature]

Presiding Commissioner

Title President

Dated: 21 December 2018

Dated: 1/17/19

APPROVED AS TO FORM:

ATTEST:

[Signature]
County Attorney

Brianna J Lennon
County Clerk

APPROVED:

[Signature]
Director, Boone County Resource Management

Engineering Surveys & Services

Consulting Engineers, Land Surveyors, and Geoprofessionals
Analytical and Materials Laboratories

1113 Fay Street
Columbia, Missouri 65201
Telephone: 573-449-2646

ess@ess-inc.com
www.ess-inc.com

HOURLY FEE SCHEDULE

January 1, 2019

Service of:	Rate:
Firm Principal	\$ 140-180 / hour
Registered Professional Engineer	\$ 130-170 / hour
Registered Professional Land Surveyor	\$ 120-150 / hour
Project Surveyor	\$ 70-100 / hour
Engineer Intern	\$ 90-120 / hour
Special Inspector	\$ 70 / hour
Engineering Technician IV	\$ 65 / hour
Engineering Technician III	\$ 60 / hour
Engineering Technician II	\$ 55 / hour
Engineering Technician I	\$ 50 / hour
AWS Certified Weld Inspector	\$ 80-90 / hour
AWS Certified Weld Inspector (Senior)	\$ 110-120 / hour
CAD Operator II	\$ 70-100 / hour
CAD Operator I	\$ 60-70 / hour
Chemist	\$ 70-90 / hour
Administrative Assistant	\$ 55-65 / hour
Computer	\$ 50 / day
Survey Equipment	\$ 100-200 / day
Drill Rig	\$ 150-250 / hour
Large Format Copies	\$ 4 - 6 each
Photocopies	\$ 0.25 each
Travel	\$ 0.58 / mile
Per Diem	\$ 120 / day

NOTES:

1. Since charges are based on salary multiplier, all rates are subject to minor fluctuations as salaries change.
2. Overtime charges at 1.4 times above rates.
3. Scheduled construction phase services and/or field observations will be charged at a 2 hour minimum.

Engineering Surveys & Services

Consulting Engineers, Land Surveyors, and Geoprofessionals
Analytical and Materials Laboratories

1113 Fay Street Street
Columbia, MO 65201
Telephone: 573-449-2646

ess@ess-inc.com
www.ess-inc.com

MATERIAL'S LABORATORY TESTING FEE SCHEDULE

January 1, 2019

The testing services shown herein represent the majority of tests that can be performed "in-house". Please call our office to discuss services and/or tests that are not shown on this Fee Schedule. We reserve the right to add, delete, or otherwise alter the information contained herein without notice, but will honor commitments previously made.

Concrete

Cast Specimen	Cylinder - Compressive Strength (6 x 12)	\$ 16.00 / ea.
	Cylinder - Compressive Strength (4 x 8)	\$ 14.50 / ea.
	Concrete Beam - Flexural Strength	\$ 45.00 / ea.
	Mortar Cube - Compressive Strength	\$ 21.00 / ea.
	Grout/Prism - Compressive Strength	\$ 23.00 / ea.
	Cylinder - Compressive Strength Cast by Others	\$ 21.50 / ea.
	Cylinder Held (spare)	\$ 5.00 / ea.
	Cylinder Mold	\$ 2.00 / ea.
	Mix Design (single point)	\$ 750.00 / ea.
	Mix Design (three point)	\$ 1,450.00 / ea.
	Mix Design (single point FAA)	\$ 950.00 / ea.
	Mix Design (three point FAA)	\$ 2,050.00 / ea.
	Chloride Ion Content (ASTM C 1218)	\$ 200.00 / ea.
	Cylinder Pickup Made by Others	\$ Hourly
	Slump, Air, Cylinders	\$ Hourly
	Cores	Core Drilling and Testing
Concrete/Asphalt Core Drill		\$ 185.00 / hr.
Generator		\$ 100.00 / hr.
Special Handling of Cores or Irregular Size Specimens		\$ 36.00 / ea.

Asphalt

	Core Density	\$ 40.00 / ea.
	Extraction Test for Oil	\$ 230.00 / ea.
	Sieve Analysis of Extracted Agg. & Extraction Test for Oil	\$ 330.00 / ea.

Structural Steel

	Structural Weld and Bolt Inspection	\$ Hourly
	Ultra-Sonic Weld Testing Equipment	\$ 175.00 / day
	Magnetic Particles or Dye Penetration	\$ Hourly

Other Offices
Columbia • Jefferson City • Wildwood

Aggregate

Particle Size	Sieve Analysis, dry	\$ 74.00 / ea.
	Sieve Analysis, wet	\$ 83.00 / ea.
	Finer than #200 by Washing	\$ 52.00 / ea.
Weight Properties	Specific Gravity & Absorption	\$ 101.00 / ea.
	Unit Weight	\$ 56.00 / ea.
Impurities	Organic Impurities in Fine Aggregate (colorimetric)	\$ 38.00 / ea.
	Lightweight Pieces (coal & lignite)	\$ 84.00 / ea.
	Clay Lumps & Friable Particles	\$ 56.00 / ea.
	Chert Content of Coarse Aggregate	\$ 125.00 / ea.
	Deleterious Materials	\$ 125.00 / ea.
	Thin or Elongated Pieces in Course Aggregate	\$ 84.00 / ea.
Rock Quality	Soundness by Sodium or Magnesium Sulfate (5 cycles)	\$ 305.00 / ea.
	Freeze-Thaw	\$ 700.00 / ea.
	L.A. Abrasion of Course Aggregate	\$ 200.00 / ea.

Soil

Classification Tests	Moisture Content	\$ 10.00 / ea.
	Particle-Size Analysis, Wet Sieve	\$ 98.00 / ea.
	Particle-Size Analysis, Hydrometer	\$ 84.00 / ea.
	Material finer than #200	\$ 70.00 / ea.
	Specific Gravity	\$ 70.00 / ea.
	Atterberg Limits	\$ 56.00 / ea.
	Shrinkage Limit	\$ 80.00 / ea.
	Dry Density of undisturbed sample	\$ 34.00 / ea.
	Fractional Organic Carbon	\$ 70.00 / ea.
Shear	Unconfined Compression Test (qu)	\$ 53.00 / ea.
	Triaxial (Q), multistage	\$ 350.00 / ea.
Compressibility Tests	Consolidation	\$ 450.00 / ea.
	Swell	\$ 205.00 / ea.
Compaction Tests	Standard Proctor	\$ 140.00 / ea.
	Modified Proctor	\$ 170.00 / ea.
	Field Density Testing	\$ Hourly
	Field Density Testing - Nuclear Meter	\$ 13.00 / hr.
	CBR	\$ 300.00 / ea.
	Flex-Wall Permeability	\$ 320.00 / ea.
	Falling-Head Permeability	\$ 260.00 / ea.
Geotechnical Drilling	Equipment and Crew	\$ Quote
	3" Shelby Tubes	\$ 18.00 / ea.
	Sample Jars	\$ 3.00 / ea.
	Special Sample Preparation	\$ Hourly



Engineering Surveys and Services LLC



2019 Discipline List

Instructions: Please place a check mark in the *Services Offered* box next to those disciplines provided by your firm.

Discipline	Services Offered	Discipline	Services Offered
Architecture <i>Sub</i>	<input checked="" type="checkbox"/>	Building Enclosure Consulting	<input checked="" type="checkbox"/> <i>Sub</i>
Bridge Design	<input type="checkbox"/>	Control System Integration	<input type="checkbox"/>
Civil Engineering	<input checked="" type="checkbox"/>	Design/Build	<input checked="" type="checkbox"/>
Construction Management	<input checked="" type="checkbox"/>	Environmental	<input checked="" type="checkbox"/>
Electrical Engineering	<input type="checkbox"/>	Forensic	<input type="checkbox"/>
Geotechnical Engineering	<input checked="" type="checkbox"/>	GIS	<input checked="" type="checkbox"/>
Lab Testing	<input checked="" type="checkbox"/>	Industrial	<input checked="" type="checkbox"/>
Mechanical Engineering	<input type="checkbox"/>	Interior Design	<input type="checkbox"/>
Planning	<input checked="" type="checkbox"/>	Landscape Architecture <i>Sub</i>	<input checked="" type="checkbox"/>
Structural Engineering	<input type="checkbox"/>	Natural Gas	<input type="checkbox"/>
Surveying	<input checked="" type="checkbox"/>	Photogrammetry	<input checked="" type="checkbox"/>
Traffic <i>Sub</i>	<input checked="" type="checkbox"/>	Telecommunications	<input type="checkbox"/>
Transportation	<input checked="" type="checkbox"/>	Water Resources	<input checked="" type="checkbox"/>
Acoustical	<input type="checkbox"/>	Unmanned Aircraft Systems	<input checked="" type="checkbox"/>

Reviewed by: *JM*

GENERAL CONSULTANT SERVICES AGREEMENT

THIS AGREEMENT dated this 17th day of January, 2018~~(2019)~~ by and between Boone County, Missouri, a first class county and political subdivision of the state of Missouri through its County Commission, (herein "Owner") and Klingner & Associates, P.C. (herein "Consultant").

IN CONSIDERATION OF the performance of the services rendered under this Agreement and payment for such services, the parties agree to the following:

1. **Agreement duration** – This contract shall be in effect beginning January 1, 2019 or the date of full execution; which ever is later and run through the calendar year ending on December 31, 2019. This agreement may be terminated in accordance with the terms and conditions set forth in this agreement.

2. **Services** - As authorized by the Owner in writing, the Consultant shall provide the Owner all engineering, surveying, and other professional services for the benefit of the Owner as prescribed by the Owner based upon requests for proposals for projects assigned during the term of this agreement and the Consultant shall provide the Owner, as applicable, with the services, reports, studies, surveys, plans, specifications, and other work required by the Owner's request for proposal. Consultant agrees to provide all such services in a timely manner as established by the Owner in writing for each assigned project, or in the absence of the designation, within a reasonable time after receipt of Owner directives. Consultant agrees to provide services by and through qualified personnel under standards and conditions generally accepted by professionals in the field or occupations for which services are provided. Services shall be provided based only upon requests for proposals provided to the Consultant by the Owner or Owner's representative and to which the Consultant prepares and submits a written proposal for services which is approved by the Owner in writing. No work shall be performed nor shall compensation be paid for Consultant work performed without an Owner approved written proposal for professional services. Proposals for services shall be in written form, as required by the request for proposal, and shall be specifically responsive to the criteria provided by the Owner in its request for proposal. All work performed by the Consultant, based upon Owner approved proposals submitted by the Consultant, shall be subject to the terms and conditions of this agreement unless otherwise specifically agreed upon by the Owner and Consultant in writing. All proposals for work submitted by the Consultant to the Owner for work shall at a minimum contain the following:

2.1 **Scope of Services** - Each proposal for services shall contain a detailed description of work to be performed by the Consultant. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to the request with the same or greater level of specificity required by the request for proposal. The Consultant shall specifically identify services which are included as basic services and those services which are excluded from basic services in the proposal. Services which the Consultant does not identify as excluded from basic services under the proposal and which are necessary for successful completion of the work in the judgment of the Owner shall be presumed to be a part of basic services under the proposal. If a request for proposal requires the Consultant to provide optional services, the Consultant's proposal shall respond to the options requested, or provide

reasons why the Consultant cannot provide or respond to the request for optional services.

2.2 **Time for Completion** - Each proposal for services shall contain a detailed description of the estimated time to complete each task or item of work to be performed by the Consultant under the proposal. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to any request for estimated or maximum completion times for work with the same or greater level of specificity required by the request for proposal.

2.3 **Compensation** - Each proposal for services shall state the basis of compensation on either: (1) an hourly fee plus expense basis with a statement of a maximum compensation to be charged, or, (2) a lump sum payment of compensation for all work to be performed, or, (3) a payment based upon unit prices. Proposals for compensation for an hourly fee plus expense basis shall provide detailed time and expense estimates to support a maximum contract amount to be charged and shall be consistent with the hourly rates, unit prices and reimbursement rates made a part of this agreement by reference in paragraph two (2) below. When the Owner or Owner's representative requests the Consultant to provide work on an hourly fee plus expense basis, the Consultant's proposal shall be responsive to the request and shall not propose payment on another basis unless otherwise authorized. Unit price proposals shall identify and estimate the quantity of units as a part of the proposal when they can be identified and estimated, or as necessary in response to a particular request for proposal requesting such information. Each proposal for services shall also state a proposed payment schedule at a frequency no greater than monthly in such amounts as are consistent with amount of work to be performed and billed. Reimbursable expenses proposed shall be specifically identified and estimated as a part of the proposal with a statement of the maximum amount to be charged unless the Owner's request for proposal specifies otherwise.

2.4 **Signatures** - Consultant proposals for services under this agreement shall be signed and dated by the Consultant or an authorized representative of the Consultant (as applicable), and shall be considered binding offers to contract open for acceptance by the Owner for an indefinite duration unless limited in the proposal or withdrawn prior to acceptance by the Owner. All proposals for services under this agreement shall be on forms approved by the Owner; use of the signature block shown in this agreement on a proposal for services shall be considered an adequate signature block. In the absence of an Owner provided form, the signature block shall contain a signature line for Boone County, Missouri by its Presiding Commissioner, a signature line for attestation by the County Clerk, a signature line approving the proposal by the Director of Resource Management, and a signature line for the County Attorney approving the proposal as to legal form. In addition, the signature block shall contain a line for insertion of the date the proposal is approved by the Owner.

3. **Compensation** - In consideration for the Consultant's provision of services under this agreement, the Owner agrees to compensate the Consultant for services rendered in accordance with the hourly rates, unit prices and reimbursement rates for expenses set forth in the schedule for hourly rates and expense charges to be in effect for the calendar year of this agreement which is either attached to this agreement or maintained on file with the Boone County Resource Management Department and is hereby incorporated by reference. No increases in the rates and charges set forth in the attached schedule shall be permitted for this

calendar year without the written authorization of the Owner. Payments shall be made within thirty (30) days of receipt of invoice by the Owner. Invoices shall be submitted periodically as mutually agreed upon by the Owner and Consultant, or in the absence of such agreement, upon completion of the work constituting the task or project for which services are provided. Invoices for services on an hourly fee plus expense basis shall individually describe the task or project by name, show hours expended by classes of personnel in increments of not less than one-half hour and rates applied, as well as describe work performed during the invoice period; reimbursable expenses shall be itemized. Invoices for services performed on a unit price basis shall identify the task or project by name, identify and quantify units charged for services during the invoice period. Invoices for services on a lump sum basis shall identify the task or project by name and the invoiced amount. Periodic invoices shall not exceed the amounts permitted in the Consultant's proposal approved by the Owner. The Owner reserves the right to withhold payment for inadequately documented invoices until documented as required herein. The Owner further reserves the right to withhold payments for unperformed work or work not performed on a timely basis in accordance with the Consultant's proposal when delays in performance of services are not attributable to the Owner, or as a result of a billing dispute between the Owner and Consultant. However, Owner agrees to pay interest at a rate of nine percent (9%) annum on any disputed billed amounts for which payments are withheld beyond thirty (30) days of invoice if and to the extent that those disputed amounts are resolved in favor of the Consultant.

4. **Owner Responsibilities** - Owner agrees to furnish Consultant with all current and available information for each task or project assigned to Consultant, along with any information necessitated by changes in work or services initiated by the Owner which may affect services rendered thereunder.

5. **Coordination of Work and Work Product** - Consultant shall coordinate all work with the Owner's designated representative for each task or project assigned to Consultant and submit to the Owner's representative all work product in written or graphic form (and in electronic form if requested) as applicable or required. All reports, surveys, test data, memoranda, samples, plans, specifications, and other documents or materials submitted by or to the Owner shall be considered the property of the Owner. When available and requested by the Owner, work product shall be provided in electronic form at actual cost in media compatible for use with Owner software and equipment.

6. **Insurance** - Consultant shall procure and maintain professional liability insurance in such amounts as are deemed mutually agreeable to the parties and approved by the Owner or the Owner's representative in writing within thirty (30) days of this Agreement. Consultant shall also maintain general public liability insurance with coverage's no less than \$2,000,000.00 per occurrence, and worker's compensation insurance as required by state law. Failure of Consultant to obtain or maintain such insurance during this contract, or to provide proper proofs thereof upon request of the Owner, shall not diminish, waive or otherwise reduce the Consultant's obligations to maintain such insurance coverage and Consultant shall indemnify and hold the Owner and all its personnel harmless from and against any and all claims, damages, losses and expenses, including reasonable attorney's fees and litigation costs, arising out of or resulting from the performance of services, provided that any such claim, damage, loss or expenses, is caused in whole or in part by the negligent act, omission and or liability of the Consultant, its agents or employees. The Consultant shall provide the Owner with certificates of insurance

exhibiting the coverage as specified above within thirty (30) days of execution of this agreement and thereafter within five (5) working days after request by the Owner. All certificates of insurance shall contain provision that insurance provided shall not be canceled or altered except upon ten (10) days written notice to the Owner.

7. **Delegation and Subcontracting** - Unless otherwise proposed and approved in the Consultant's proposal for services, the Consultant shall not delegate or subcontract any work to be performed by the Consultant under this agreement to any other person, business or entity without the express advance written approval of the Owner for such delegation or subcontract work.

8. **Records and Samples** - To the extent not otherwise transferred to the Owner's possession, Consultant agrees to retain and provide the Owner with reasonable access to all work product, records, papers and other documents involving transactions and work related to or performed under this agreement for a period of three (3) years after this agreement expires. When services involve testing or sampling, Consultant agrees to either retain all test products or samples collected by or submitted to Consultant, or return same to the Owner as mutually agreed upon. In absence of agreement, Consultant shall not dispose of test samples or products without notice to or consent by the Owner or the Owner's representative.

9. **Additional Services** - No compensation shall be paid for any service rendered by the Consultant considered an additional service beyond the scope of services approved by the Owner unless rendition of that service and expense thereof has been authorized in writing by the Owner in advance of performance of such service. Any additional services performed by the Consultant prior to such authorization by the Owner shall be deemed a part of basic services for work performed under an Owner approved proposal for services governed by this agreement, whether enumerated in this agreement or not, for which the Consultant shall be entitled to no additional compensation.

10. **Owner Authorization** -When the term Owner is used in this agreement, it shall mean the government of Boone County, Missouri or the Boone County Commission, as the context requires. Authorization by the Owner shall mean authorization obtained by recorded majority vote of the Boone County Commission. It is further understood and agreed that no person or party is authorized to bind the Owner to any proposed agreement for services under the auspices of this agreement without having obtained the prior approval of the Boone County Commission by recorded majority vote for such authorization. In this regard, it is understood and agreed that the Consultant shall not be entitled to rely upon verbal or written representations by any agent or employee of the Owner in deviation to the terms and conditions of this agreement, or as authorization for compensation for services except as may be approved by recorded vote of the Boone County Commission. When the term Owner's representative is used, it shall mean the Director of the Boone County Resource Management Department or his designee as specified in writing. It shall be presumed that such representative shall have all necessary decision making authority with respect to services provided under this agreement and Owner approved proposals for services except such representative shall have no authority to make decisions concerning changes to the Consultant's compensation or reimbursement, or with respect to services to be performed under this agreement or Owner approved proposal for services which involve or affect cost, expense or budgetary allowances.

11. **Termination** - The Owner may and reserves the right to terminate this agreement at any time with or without cause by giving the Consultant written notice of termination. Upon receipt of such notice, Consultant shall discontinue all services in connection with the performance of services authorized under this agreement or Owner approved proposal for services and Owner shall upon invoice remit payment for all authorized services completed up to the date of termination notice. Upon payment of this invoice, the Consultant shall deliver any and all work product including drawings, plans, and specifications, or other documents, prepared as instruments of service, whether complete or in progress. It is further agreed that if services are terminated the Consultant shall be compensated for all services rendered through the date of termination not to exceed the amount authorized for services through the date of termination. If the Owner questions the extent of work on a final invoice, the Consultant shall give the Owner the opportunity to review and evaluate all work upon which the invoice is based in the offices of the Consultant prior to payment. This agreement or work performed under the provisions of this agreement may also be terminated by the Consultant upon not less than seven days written notice in the event the Owner shall substantially fail to perform in accordance with the terms and conditions of this agreement, through no fault of the Consultant. In the event of termination by the Consultant, the other provisions concerning termination contained in this paragraph shall be applicable.

12. **Governing Law** - This agreement shall be governed by the laws of the state of Missouri and it is agreed that this agreement is made in Boone County, Missouri and that Boone County, Missouri is proper venue for any action pertaining to the interpretation or enforcement of any provision within or services performed under this agreement.

13. **Certification of Lawful Presence / Work Authorization** - Consultant shall complete and return the Work Authorization Certification attached hereto, and if applicable, the other required lawful presence documents for an individual Consultant.

14. **Miscellaneous** - This agreement constitutes the entire agreement of the parties superseding all prior negotiations, written or verbal, and may only be amended by signed writing executed by the parties through their authorized representatives hereunder.

IN WITNESS WHEREOF, the parties have executed this agreement by their duly authorized signatories effective the date and year first-above written.

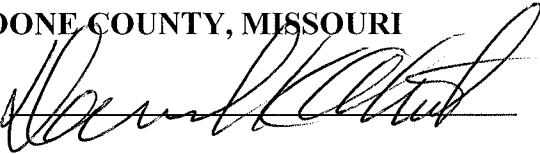
KLINGNER & ASSOCIATES, P.C.

By 

Title Branch Manager

Dated: 1/2/19

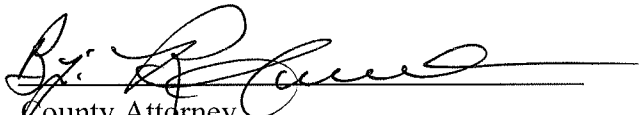
BOONE COUNTY, MISSOURI

By 

Presiding Commissioner

Dated: 1/17/19

APPROVED AS TO FORM:

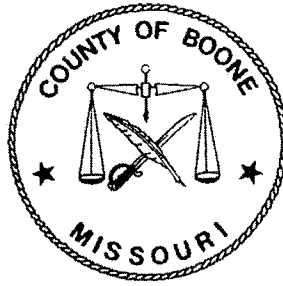

County Attorney

ATTEST:

Brianna A. Lennon att
County Clerk

APPROVED:


Director, Boone County Resource Management



Klingner & Associates, P.C.

2019 Discipline List

Instructions: Please place a check mark in the Services Offered box next to those disciplines provided by your firm

Discipline	Services Offered
Architecture	X
Bridge Design	X
Civil Engineering	X
Construction Management	
Electrical Engineering	X
Geotechnical Engineering	X
Lab Testing	
Mechanical Engineering	X
Planning	X
Structural Engineering	X
Surveying	X
Traffic	X
Transportation	X
Acoustical	
Building Enclosure Consulting	X
Control System Integration	
Design/Build	X
Environmental	X
Forensic	X
GIS	
Industrial	X
Interior Design	X
Landscape Architecture	X
Natural Gas	X
Photogrammetry	X
Telecommunications	

Reviewed by: *jm*

SCHEDULE OF HOURLY RATES (Per Diem)
EFFECTIVE JANUARY 1, 2019 THROUGH DECEMBER 31, 2019

Charges for professional services for projects which are not based upon a percentage of construction cost, cost plus fixed fee, lump sum fee, or payroll cost, shall be based upon the following per diem rates plus reimbursable expenses:

PROFESSIONAL SERVICES

<u>Classification</u>	<u>Rate Per Hour</u>
C1-C4: Clerical	\$65.00
T-1 Technician I	\$60.00
T-2 Technician II	\$68.00
T-3 Technician III	\$80.00
T-4 Technician IV	\$90.00
T-5 Technician V	\$105.00
T-6 Technical Supervisor	\$120.00
A-1 Administrative Aide	\$53.00
A-2 Administrative Assistant	\$75.00
A-3 Administrative Manager	\$118.00
A-4 General Manager	\$121.00
P-1 Assistant Engineer/Architect/Surveyor/Planner	\$98.00
P-2 Intern Engineer/Architect/Surveyor/Planner	\$110.00
P-3 Engineer/Architect/Surveyor/Planner	\$119.00
P-4 Project Engineer/Architect/Surveyor/Planner	\$137.00
P-5 Senior Engineer/Architect/Surveyor/Planner	\$146.00
P-6 Proj./Dept./Branch Manager, Chief Eng./Architect/Surveyor/Planner	\$167.00
P-7 Director of Engineering/Architecture/Surveying/Planning	\$188.00
P-8 Principal, Partner, Manager of Engineering/Architecture/Surveying/Planning ...	\$210.00

Court testimony by principal or other registered professional will be charged at the rate of \$2,000.00 per day plus reimbursable expenses.

REIMBURSABLE EXPENSES (partial listing)

Mileage (<i>may adjust due to fuel fluctuations</i>)	\$ 0.55 per Mile
Reproduction (i.e. Prints, Copies, Plans, etc)	At Cost + 15%
Computer Aided Design/Drafting	\$ 15.00 per Hour
Global Positioning & Robotic Survey Equipment	\$ 24.00 per Hour
3D Scanner	\$200.00 per Hour
Long Distance & Cell Calls, Subsistence & Lodging	At Cost
Special Consultants	At Cost + 15%
Non-reusable Supplies	At Cost + 15%

LABOR RATE 01 effective 07-01-18
Per Diem

GENERAL CONSULTANT SERVICES AGREEMENT

THIS AGREEMENT dated this 17th day of January, 2018/2019, by and between Boone County, Missouri, a first class county and political subdivision of the state of Missouri through its County Commission, (herein "Owner") and McClure Engineering Co (herein "Consultant").

IN CONSIDERATION OF the performance of the services rendered under this Agreement and payment for such services, the parties agree to the following:

1. **Agreement duration** – This contract shall be in effect beginning January 1, 2019 or the date of full execution; which ever is later and run through the calendar year ending on December 31, 2019. This agreement may be terminated in accordance with the terms and conditions set forth in this agreement.

2. **Services** - As authorized by the Owner in writing, the Consultant shall provide the Owner all engineering, surveying, and other professional services for the benefit of the Owner as prescribed by the Owner based upon requests for proposals for projects assigned during the term of this agreement and the Consultant shall provide the Owner, as applicable, with the services, reports, studies, surveys, plans, specifications, and other work required by the Owner's request for proposal. Consultant agrees to provide all such services in a timely manner as established by the Owner in writing for each assigned project, or in the absence of the designation, within a reasonable time after receipt of Owner directives. Consultant agrees to provide services by and through qualified personnel under standards and conditions generally accepted by professionals in the field or occupations for which services are provided. Services shall be provided based only upon requests for proposals provided to the Consultant by the Owner or Owner's representative and to which the Consultant prepares and submits a written proposal for services which is approved by the Owner in writing. No work shall be performed nor shall compensation be paid for Consultant work performed without an Owner approved written proposal for professional services. Proposals for services shall be in written form, as required by the request for proposal, and shall be specifically responsive to the criteria provided by the Owner in its request for proposal. All work performed by the Consultant, based upon Owner approved proposals submitted by the Consultant, shall be subject to the terms and conditions of this agreement unless otherwise specifically agreed upon by the Owner and Consultant in writing. All proposals for work submitted by the Consultant to the Owner for work shall at a minimum contain the following:

2.1 **Scope of Services** - Each proposal for services shall contain a detailed description of work to be performed by the Consultant. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to the request with the same or greater level of specificity required by the request for proposal. The Consultant shall specifically identify services which are included as basic services and those services which are excluded from basic services in the proposal. Services which the Consultant does not identify as excluded from basic services under the proposal and which are necessary for successful completion of the work in the judgment of the Owner shall be presumed to be a part of basic services under the proposal. If a request for proposal requires the Consultant to provide optional services, the Consultant's proposal shall respond to the options requested, or provide

reasons why the Consultant cannot provide or respond to the request for optional services.

2.2 **Time for Completion** - Each proposal for services shall contain a detailed description of the estimated time to complete each task or item of work to be performed by the Consultant under the proposal. When the Owner provides the Consultant with a written and/or graphic request for proposal, the Consultant's proposal shall be responsive to any request for estimated or maximum completion times for work with the same or greater level of specificity required by the request for proposal.

2.3 **Compensation** - Each proposal for services shall state the basis of compensation on either: (1) an hourly fee plus expense basis with a statement of a maximum compensation to be charged, or, (2) a lump sum payment of compensation for all work to be performed, or, (3) a payment based upon unit prices. Proposals for compensation for an hourly fee plus expense basis shall provide detailed time and expense estimates to support a maximum contract amount to be charged and shall be consistent with the hourly rates, unit prices and reimbursement rates made a part of this agreement by reference in paragraph two (2) below. When the Owner or Owner's representative requests the Consultant to provide work on an hourly fee plus expense basis, the Consultant's proposal shall be responsive to the request and shall not propose payment on another basis unless otherwise authorized. Unit price proposals shall identify and estimate the quantity of units as a part of the proposal when they can be identified and estimated, or as necessary in response to a particular request for proposal requesting such information. Each proposal for services shall also state a proposed payment schedule at a frequency no greater than monthly in such amounts as are consistent with amount of work to be performed and billed. Reimbursable expenses proposed shall be specifically identified and estimated as a part of the proposal with a statement of the maximum amount to be charged unless the Owner's request for proposal specifies otherwise.

2.4 **Signatures** - Consultant proposals for services under this agreement shall be signed and dated by the Consultant or an authorized representative of the Consultant (as applicable), and shall be considered binding offers to contract open for acceptance by the Owner for an indefinite duration unless limited in the proposal or withdrawn prior to acceptance by the Owner. All proposals for services under this agreement shall be on forms approved by the Owner; use of the signature block shown in this agreement on a proposal for services shall be considered an adequate signature block. In the absence of an Owner provided form, the signature block shall contain a signature line for Boone County, Missouri by its Presiding Commissioner, a signature line for attestation by the County Clerk, a signature line approving the proposal by the Director of Resource Management, and a signature line for the County Attorney approving the proposal as to legal form. In addition, the signature block shall contain a line for insertion of the date the proposal is approved by the Owner.

3. **Compensation** - In consideration for the Consultant's provision of services under this agreement, the Owner agrees to compensate the Consultant for services rendered in accordance with the hourly rates, unit prices and reimbursement rates for expenses set forth in the schedule for hourly rates and expense charges to be in effect for the calendar year of this agreement which is either attached to this agreement or maintained on file with the Boone County Resource Management Department and is hereby incorporated by reference. No increases in the rates and charges set forth in the attached schedule shall be permitted for this

calendar year without the written authorization of the Owner. Payments shall be made within thirty (30) days of receipt of invoice by the Owner. Invoices shall be submitted periodically as mutually agreed upon by the Owner and Consultant, or in the absence of such agreement, upon completion of the work constituting the task or project for which services are provided. Invoices for services on an hourly fee plus expense basis shall individually describe the task or project by name, show hours expended by classes of personnel in increments of not less than one-half hour and rates applied, as well as describe work performed during the invoice period; reimbursable expenses shall be itemized. Invoices for services performed on a unit price basis shall identify the task or project by name, identify and quantify units charged for services during the invoice period. Invoices for services on a lump sum basis shall identify the task or project by name and the invoiced amount. Periodic invoices shall not exceed the amounts permitted in the Consultant's proposal approved by the Owner. The Owner reserves the right to withhold payment for inadequately documented invoices until documented as required herein. The Owner further reserves the right to withhold payments for unperformed work or work not performed on a timely basis in accordance with the Consultant's proposal when delays in performance of services are not attributable to the Owner, or as a result of a billing dispute between the Owner and Consultant. However, Owner agrees to pay interest at a rate of nine percent (9%) annum on any disputed billed amounts for which payments are withheld beyond thirty (30) days of invoice if and to the extent that those disputed amounts are resolved in favor of the Consultant.

4. **Owner Responsibilities** - Owner agrees to furnish Consultant with all current and available information for each task or project assigned to Consultant, along with any information necessitated by changes in work or services initiated by the Owner which may affect services rendered thereunder.

5. **Coordination of Work and Work Product** - Consultant shall coordinate all work with the Owner's designated representative for each task or project assigned to Consultant and submit to the Owner's representative all work product in written or graphic form (and in electronic form if requested) as applicable or required. All reports, surveys, test data, memoranda, samples, plans, specifications, and other documents or materials submitted by or to the Owner shall be considered the property of the Owner. When available and requested by the Owner, work product shall be provided in electronic form at actual cost in media compatible for use with Owner software and equipment.

6. **Insurance** - Consultant shall procure and maintain professional liability insurance in such amounts as are deemed mutually agreeable to the parties and approved by the Owner or the Owner's representative in writing within thirty (30) days of this Agreement. Consultant shall also maintain general public liability insurance with coverage's no less than \$2,000,000.00 per occurrence, and worker's compensation insurance as required by state law. Failure of Consultant to obtain or maintain such insurance during this contract, or to provide proper proofs thereof upon request of the Owner, shall not diminish, waive or otherwise reduce the Consultant's obligations to maintain such insurance coverage and Consultant shall indemnify and hold the Owner and all its personnel harmless from and against any and all claims, damages, losses and expenses, including reasonable attorney's fees and litigation costs, arising out of or resulting from the performance of services, provided that any such claim, damage, loss or expenses, is caused in whole or in part by the negligent act, omission and or liability of the Consultant, its agents or employees. The Consultant shall provide the Owner with certificates of insurance

exhibiting the coverage as specified above within thirty (30) days of execution of this agreement and thereafter within five (5) working days after request by the Owner. All certificates of insurance shall contain provision that insurance provided shall not be canceled or altered except upon ten (10) days written notice to the Owner.

7. **Delegation and Subcontracting** - Unless otherwise proposed and approved in the Consultant's proposal for services, the Consultant shall not delegate or subcontract any work to be performed by the Consultant under this agreement to any other person, business or entity without the express advance written approval of the Owner for such delegation or subcontract work.

8. **Records and Samples** - To the extent not otherwise transferred to the Owner's possession, Consultant agrees to retain and provide the Owner with reasonable access to all work product, records, papers and other documents involving transactions and work related to or performed under this agreement for a period of three (3) years after this agreement expires. When services involve testing or sampling, Consultant agrees to either retain all test products or samples collected by or submitted to Consultant, or return same to the Owner as mutually agreed upon. In absence of agreement, Consultant shall not dispose of test samples or products without notice to or consent by the Owner or the Owner's representative.

9. **Additional Services** - No compensation shall be paid for any service rendered by the Consultant considered an additional service beyond the scope of services approved by the Owner unless rendition of that service and expense thereof has been authorized in writing by the Owner in advance of performance of such service. Any additional services performed by the Consultant prior to such authorization by the Owner shall be deemed a part of basic services for work performed under an Owner approved proposal for services governed by this agreement, whether enumerated in this agreement or not, for which the Consultant shall be entitled to no additional compensation.

10. **Owner Authorization** -When the term Owner is used in this agreement, it shall mean the government of Boone County, Missouri or the Boone County Commission, as the context requires. Authorization by the Owner shall mean authorization obtained by recorded majority vote of the Boone County Commission. It is further understood and agreed that no person or party is authorized to bind the Owner to any proposed agreement for services under the auspices of this agreement without having obtained the prior approval of the Boone County Commission by recorded majority vote for such authorization. In this regard, it is understood and agreed that the Consultant shall not be entitled to rely upon verbal or written representations by any agent or employee of the Owner in deviation to the terms and conditions of this agreement, or as authorization for compensation for services except as may be approved by recorded vote of the Boone County Commission. When the term Owner's representative is used, it shall mean the Director of the Boone County Resource Management Department or his designee as specified in writing. It shall be presumed that such representative shall have all necessary decision making authority with respect to services provided under this agreement and Owner approved proposals for services except such representative shall have no authority to make decisions concerning changes to the Consultant's compensation or reimbursement, or with respect to services to be performed under this agreement or Owner approved proposal for services which involve or affect cost, expense or budgetary allowances.

11. **Termination** - The Owner may and reserves the right to terminate this agreement at any time with or without cause by giving the Consultant written notice of termination. Upon receipt of such notice, Consultant shall discontinue all services in connection with the performance of services authorized under this agreement or Owner approved proposal for services and Owner shall upon invoice remit payment for all authorized services completed up to the date of termination notice. Upon payment of this invoice, the Consultant shall deliver any and all work product including drawings, plans, and specifications, or other documents, prepared as instruments of service, whether complete or in progress. It is further agreed that if services are terminated the Consultant shall be compensated for all services rendered through the date of termination not to exceed the amount authorized for services through the date of termination. If the Owner questions the extent of work on a final invoice, the Consultant shall give the Owner the opportunity to review and evaluate all work upon which the invoice is based in the offices of the Consultant prior to payment. This agreement or work performed under the provisions of this agreement may also be terminated by the Consultant upon not less than seven days written notice in the event the Owner shall substantially fail to perform in accordance with the terms and conditions of this agreement, through no fault of the Consultant. In the event of termination by the Consultant, the other provisions concerning termination contained in this paragraph shall be applicable.

12. **Governing Law** - This agreement shall be governed by the laws of the state of Missouri and it is agreed that this agreement is made in Boone County, Missouri and that Boone County, Missouri is proper venue for any action pertaining to the interpretation or enforcement of any provision within or services performed under this agreement.

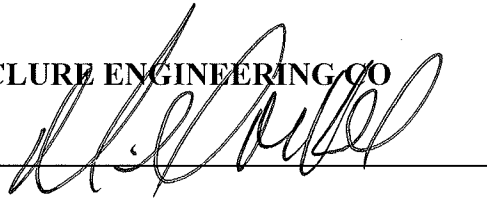
13. **Certification of Lawful Presence / Work Authorization** - Consultant shall complete and return the Work Authorization Certification attached hereto, and if applicable, the other required lawful presence documents for an individual Consultant.

14. **Miscellaneous** - This agreement constitutes the entire agreement of the parties superseding all prior negotiations, written or verbal, and may only be amended by signed writing executed by the parties through their authorized representatives hereunder.

IN WITNESS WHEREOF, the parties have executed this agreement by their duly authorized signatories effective the date and year first-above written.

MCCLURE ENGINEERING CO

By

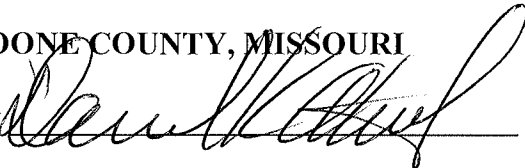


Title SENIOR PROJECT MANAGER

Dated: 12-28-18

BOONE COUNTY, MISSOURI

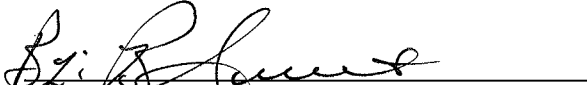
By



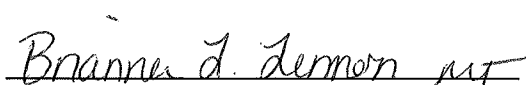
Presiding Commissioner

Dated: 1-17-19

APPROVED AS TO FORM:


County Attorney

ATTEST:


County Clerk

APPROVED:


Director, Boone County Resource Management

McCLURE DISCIPLINE LIST



McClure Engineering Co

2019 Discipline List

Instructions: Please place a check mark in the Services Offered box next to those disciplines provided by your firm

Discipline	Services Offered	
Architecture		
Bridge Design	X	
Civil Engineering	X	
Construction Management	X	
Electrical Engineering	X	
Geotechnical Engineering	X	Sub
Lab Testing		
Mechanical Engineering	X	
Planning	X	
Structural Engineering	X	
Surveying	X	
Traffic	X	Sub
Transportation	X	
Acoustical		
Building Enclosure Consulting		
Control System Integration		
Design/Build	X	
Environmental	X	Sub
Forensic		
GIS	X	
Industrial		
Interior Design		
Landscape Architecture	X	
Natural Gas	X	
Photogrammetry		
Telecommunications		

Reviewed by: djm

EXHIBIT 'A'
 McCLURE ENGINEERING COMPANY
 HOURLY RATE SCHEDULE
 (Effective through December 31, 2019)

<u>PERSONNEL</u>	<u>HOURLY RATE</u>
Administrative	\$70.00
Client Liaison	\$180.00
Engineer I	\$110.00
Engineer II	\$140.00
Engineer III	\$170.00
Engineer IV	\$210.00
Project Manager I	\$170.00
Project Manager II	\$195.00
Project Coordinator	\$90.00
Principal	\$245.00
Senior Principal	\$295.00
Community Planner I	\$135.00
Community Planner II	\$225.00
Landscape Architect I	\$100.00
Landscape Architect II	\$130.00
Engineering Tech I	\$85.00
Engineering Tech II	\$100.00
Engineering Tech III	\$120.00
Engineering Tech IV	\$150.00
Land Surveyor I	\$130.00
Land Surveyor II	\$160.00
On-Site Representative I (OSR I)	\$105.00
On-Site Representative II (OSR II)	\$145.00
Crew Chief (CC)	\$120.00
Crew Member (CM)	\$90.00
Intern	\$70.00
Survey Crew	\$200.00

EQUIPMENT

3D Scanner per Scan	\$30.00
UAV per Flight	\$125.00
Sonar Boat	\$125.00

MISCELLANEOUS EXPENSES

Survey Vehicle Mileage	\$0.70/Mile
Automobile Mileage (at current IRS rate)	\$0.545/Mile
Printing	At Cost + 10%
Survey Supplies (Hubs, Lath, Paint, Nails, etc.)	At Cost + 10%
Out-of-Pocket Expenses (Meals, Hotels, etc.)	At Cost + 10%

CERTIFIED COPY OF ORDER

STATE OF MISSOURI

County of Boone

} ea.

January Session of the January Adjourned

Term. 20 19

In the County Commission of said county, on the

17th

day of

January

20 19

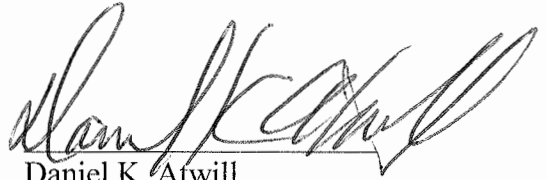
the following, among other proceedings, were had, viz:

Now on this day the County Commission of the County of Boone does hereby approve the Organizational Use of the Boone County Government Center Chambers by Bahai Faith Community on February 24th, 2019 from 1:00 pm to 5:00 pm.

Done this 17th day of January, 2019.

ATTEST:

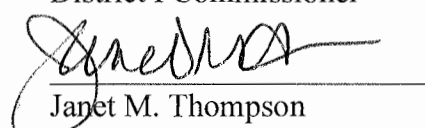
Brianna L. Lennon
Brianna L. Lennon
Clerk of the County Commission



Daniel K. Atwill
Presiding Commissioner



Fred J. Parry
District I Commissioner



Janet M. Thompson
District II Commissioner



Boone County Commission

APPLICATION FOR ORGANIZATIONAL USE OF BOONE COUNTY CONFERENCE ROOMS

The undersigned organization hereby applies for a use permit to use Boone County Government conference rooms as follows:

Organization : Bahai _____

Address: 205 Blue Sky Court _____

City: Columbia _____ State: MO _____ ZIP Code 65203 _____

Phone: 573-445-6853 _____ Website: www.columbiabahai.org _____

Individual Requesting Use: Farah Nieuwenhuizen _____ Position in Organization: Assistant secretary _____

Facility requested: Chambers Room 301 Room 311 Room 332 Centralia Clinic

Event: Bahai celebration of holy days _____

Description of Use (ex. Speaker, meeting, reception): Speaker and reception _____

Date(s) of Use: Sunday February 24/2019 _____

Start Time of Setup: 1:00 pm _____ AM/PM Start Time of Event: 2:00pm _____ AM/PM

End Time of Event: 4:00 pm _____ AM/PM End Time of Cleanup: 5:00pm _____ AM/PM

The undersigned organization agrees to abide by the following terms and conditions in the event this application is approved:

1. To abide by all applicable laws, ordinances and county policies in using Boone County Government conference rooms.
2. To remove all trash or other debris that may be deposited (by participants) in rooms by the organizational use.
3. To repair, replace, or pay for the repair or replacement of damaged property including carpet and furnishings in rooms.
4. To conduct its use in such a manner as to not unreasonably interfere with Boone County Government building functions.
5. To indemnify and hold the County of Boone, its officers, agents and employees, harmless from any and all claims, demands, damages, actions, causes of action or suits of any kind or nature including costs, litigation expenses, attorney fees, judgments, settlements on account of bodily injury or property damage incurred by anyone participating in or attending the organizational use of rooms as specified in this application.

Organization Representative/Title: Assistant secretary _____

Phone Number: 573-445-6853 _____ Date of Application, Jan. 8/2019 _____

Email Address: farahn19@yahoo.com _____

Applications may be submitted in person or by mail to the Boone County Commission, 801 E. Walnut, Room 333, Columbia, MO 65201 or by email to commission@boonecountymo.org.

PERMIT FOR ORGANIZATIONAL USE OF BOONE COUNTY GOVERNMENT CONFERENCE ROOMS

The County of Boone hereby grants the above application for permit in accordance with the terms and conditions above written. The above permit is subject to termination for any reason by duly entered order of the Boone County Commission.

ATTEST:

Brianna L. Lennon

County Clerk

BOONE COUNTY, MISSOURI

Roger D. Wilson

County Commissioner

DATE: 1.17.19 _____

24 -2019

CERTIFIED COPY OF ORDER

STATE OF MISSOURI

January Session of the January Adjourned

Term. 20 19

County of Boone

} ea.

In the County Commission of said county, on the 17th day of January 20 19

the following, among other proceedings, were had, viz:

Now on this day the County Commission of the County of Boone does hereby approve the Organizational Use of the Boone County Government Center Chambers by Greenbelt Land Trust of Mid-Missouri for its 2019 monthly meetings starting on March 19th, 2019 and ending on December 17th, 2019 from 6:00 pm to 9:30 pm.

Done this 17th day of January, 2019.

ATTEST:

Brianna L. Lennon
Brianna L. Lennon
Clerk of the County Commission

Daniel K. Atwill

Daniel K. Atwill
Presiding Commissioner

Fred A. Parry

Fred A. Parry
District I Commissioner

Janet M. Thompson

Janet M. Thompson
District II Commissioner



Boone County Commission

APPLICATION FOR ORGANIZATIONAL USE OF BOONE COUNTY CONFERENCE ROOMS

The undersigned organization hereby applies for a use permit to use Boone County Government conference rooms as follows:

Organization: Greenbelt Land Trust of Mid-Missouri
Address: PO Box 1414
City: Columbia State: MO ZIP Code: 65205
Phone: (573) 340-3927 Website: greenbeltmissouri.org
Individual Requesting Use: Mike Powell Position in Organization: Executive Director

Facility requested: Chambers Room 301 Room 311 Room 332 Centralia Clinic

Event: Board Meeting
Description of Use (ex. Speaker, meeting, reception): Board Meeting
Date(s) of Use: 3/19/19, 4/16/19, 5/21/19, 6/18/19, 7/16/19, 8/20/19, 9/17/19, 10/15/19, 11/19/19, 12/17/19
Start Time of Setup: 10PM AM/PM Start Time of Event: 7PM
End Time of Event: 9PM AM/PM End Time of Cleanup: 9:30PM

The undersigned organization agrees to abide by the following terms and conditions in the event this application is approved:

1. To abide by all applicable laws, ordinances and county policies in using Boone County Government conference rooms.
2. To remove all trash or other debris that may be deposited (by participants) in rooms by the organizational use.
3. To repair, replace, or pay for the repair or replacement of damaged property including carpet and furnishings in rooms.
4. To conduct its use in such a manner as to not unreasonably interfere with Boone County Government building functions.
5. To indemnify and hold the County of Boone, its officers, agents and employees, harmless from any and all claims, demands, damages, actions, causes of action or suits of any kind or nature including costs, litigation expenses, attorney fees, judgments, settlements on account of bodily injury or property damage incurred by anyone participating in or attending the organizational use of rooms as specified in this application.

Organization Representative/Title: ~~Roger B. Wilson~~ Mike Powell, Executive Director
Phone Number: (573) 340-3927 Date of Application: 1/10/19
Email Address: mpowell@greenbeltmissouri.org

Applications may be submitted in person or by mail to the Boone County Commission, 801 E. Walnut, Room 333, Columbia, MO 65201 or by email to commission@boonecountymo.org.

PERMIT FOR ORGANIZATIONAL USE OF BOONE COUNTY GOVERNMENT CONFERENCE ROOMS

The County of Boone hereby grants the above application for permit in accordance with the terms and conditions above written. The above permit is subject to termination for any reason by duly entered order of the Boone County Commission.

ATTEST:

Brianna J. Zannoner
County Clerk

BOONE COUNTY, MISSOURI

Roger B. Wilson
County Commissioner

DATE: 1.17.19

CERTIFIED COPY OF ORDER

STATE OF MISSOURI }
County of Boone } ea.

January Session of the January Adjourned

Term. 20 19

In the County Commission of said county, on the 17th day of January 20 19

the following, among other proceedings, were had, viz:

Now on this day the County Commission of the County of Boone does hereby approve the Organizational Use of the Boone County Government Center Chambers by Osage Group of Sierra Club on February 13th, 2019 from 6:00 pm to 9:00 pm.

Done this 17th day of January, 2019.

ATTEST:

Brianna L. Lennon
Brianna L. Lennon
Clerk of the County Commission

[Signature]
Daniel K. Atwill
Presiding Commissioner

[Signature]
Fred J. Parry
District I Commissioner

[Signature]
Janet M. Thompson
District II Commissioner



Boone County Commission

APPLICATION FOR ORGANIZATIONAL USE OF BOONE COUNTY CONFERENCE ROOMS

The undersigned organization hereby applies for a use permit to use Boone County Government conference rooms as follows:

Organization: Osage Group of Sierra Club
Address: 4804 Shale Oaks Avenue
City: Columbia State: MO ZIP Code: 65203
Phone: 417-793-8600 Website: https://www.sierraclub.org/missouri/osage
Individual Requesting Use: Mitch Skov Position in Organization: Secretary

Facility requested: Chambers Room 301 Room 311 Room 332 Centralia Clinic

Event: General meeting for February

Description of Use (ex. Speaker, meeting, reception): general meeting, including program/speaker

Date(s) of Use: Wednesday, February 13

Start Time of Setup: 6:00 p.m. AM/PM Start Time of Event: 7:00 p.m. AM/PM

End Time of Event: 8:30 p.m. AM/PM End Time of Cleanup: 9:00 p.m. AM/PM

The undersigned organization agrees to abide by the following terms and conditions in the event this application is approved:

1. To abide by all applicable laws, ordinances and county policies in using Boone County Government conference rooms.
2. To remove all trash or other debris that may be deposited (by participants) in rooms by the organizational use.
3. To repair, replace, or pay for the repair or replacement of damaged property including carpet and furnishings in rooms.
4. To conduct its use in such a manner as to not unreasonably interfere with Boone County Government building functions.
5. To indemnify and hold the County of Boone, its officers, agents and employees, harmless from any and all claims, demands, damages, actions, causes of action or suits of any kind or nature including costs, litigation expenses, attorney fees, judgments, settlements on account of bodily injury or property damage incurred by anyone participating in or attending the organizational use of rooms as specified in this application.

Organization Representative/Title: Mitch Skov, Secretary

Phone Number: 573-874-7243 Date of Application: 1-14-2019

Email Address: mmskov@gmail.com

Applications may be submitted in person or by mail to the Boone County Commission, 801 E. Walnut, Room 333, Columbia, MO 65201 or by email to commission@boonecountymo.org.

PERMIT FOR ORGANIZATIONAL USE OF BOONE COUNTY GOVERNMENT CONFERENCE ROOMS

The County of Boone hereby grants the above application for permit in accordance with the terms and conditions above written. The above permit is subject to termination for any reason by duly entered order of the Boone County Commission.

ATTEST:

Brianna L. Dennon
County Clerk

BOONE COUNTY, MISSOURI

Roger B. Wilson
County Commissioner

DATE: 1-17-19

CERTIFIED COPY OF ORDER

STATE OF MISSOURI

County of Boone

} ea.

January Session of the January Adjourned

Term. 20 19

In the County Commission of said county, on the

17th

day of

January

20 19

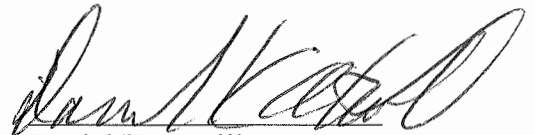
the following, among other proceedings, were had, viz:

Now on this day the County Commission of the County of Boone does hereby approve the Organizational Use of the Boone County Government Center Chambers by Our Revolution: Mid-Missouri on the first Wednesday of every month of 2019 from 6:00 pm to 8:30 pm for its monthly meeting.

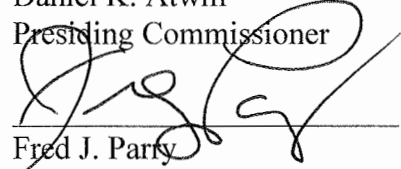
Done this 17th day of January, 2019.

ATTEST:

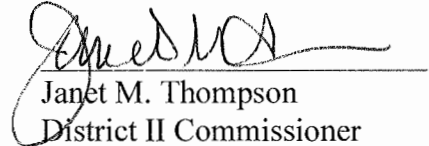
Brianna L. Lennon
Brianna L. Lennon
Clerk of the County Commission



Daniel K. Atwill
Presiding Commissioner

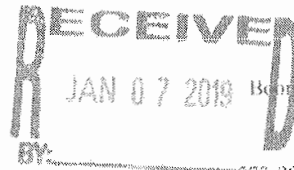


Fred J. Parry
District I Commissioner



Janet M. Thompson
District II Commissioner

Daniel K. Atwill, Presiding Commissioner
Fred J. Parry, District I Commissioner
Janet M. Thompson, District II Commissioner



Roger B. Wilson
Boone County Government Center
801 East Walnut, Room 333
Columbia, MO 65201-7732
573-886-4305 • FAX 573-886-4311

Boone County Commission

APPLICATION FOR ORGANIZATIONAL USE OF BOONE COUNTY CONFERENCE ROOMS

The undersigned organization hereby applies for a use permit to use Boone County Government conference rooms as follows:

Organization: Our Revolution: Mid-Missouri

Address: 2102 Ammonette St.

City: Columbia State: MO ZIP Code: 65201

Phone: 573-310-4519 Website: midmo.org

Individual Requesting Use: Tao Weilundemo Position in Organization: Board Member

Facility requested: Chambers Room 301 Room 311 Room 332 Centralia Clinic

Event: Monthly general membership meetings

Description of Use (ex. Speaker, meeting, reception): Meeting

Date(s) of Use: First Wednesdays

Start Time of Setup: 6:00 PM AM/PM Start Time of Event: 6:30 PM AM/PM

End Time of Event: 8:00 PM AM/PM End Time of Cleanup: 8:30 PM AM/PM

The undersigned organization agrees to abide by the following terms and conditions in the event this application is approved:

1. To abide by all applicable laws, ordinances and county policies in using Boone County Government conference rooms.
2. To remove all trash or other debris that may be deposited (by participants) in rooms by the organizational use.
3. To repair, replace, or pay for the repair or replacement of damaged property including carpet and furnishings in rooms.
4. To conduct its use in such a manner as to not unreasonably interfere with Boone County Government building functions.
5. To indemnify and hold the County of Boone, its officers, agents and employees, harmless from any and all claims, demands, damages, actions, causes of action or suits of any kind or nature including costs, litigation expenses, attorney fees, judgments, settlements on account of bodily injury or property damage incurred by anyone participating in or attending the organizational use of rooms as specified in this application.

Organization Representative/Title: Tao Weilundemo / Board Member

Phone Number: 573-310-4519 Date of Application: 1/2/2019

Email Address: tao@midmo.org

Applications may be submitted in person or by mail to the Boone County Commission, 801 E. Walnut, Room 333, Columbia, MO 65201 or by email to commiss@boonecountymo.org.

PERMIT FOR ORGANIZATIONAL USE OF BOONE COUNTY GOVERNMENT CONFERENCE ROOMS

The County of Boone hereby grants the above application for permit in accordance with the terms and conditions above written. The above permit is subject to termination for any reason by duly entered order of the Boone County Commission.

ATTEST:

Brianna A. Demmon
County Clerk

BOONE COUNTY, MISSOURI

[Signature]
County Commissioner

DATE: 1-17-19