

**Contract for Professional Services with Merrick & Company
for LIDAR Topographic Surveying Services**

In consideration of the mutual promises herein, ANCHORAGE and Merrick & Company agree as follows. This Contract consists of:

- Part I, consisting of 15 Sections of Special Provisions;
- Part II, consisting of 11 Sections of General Provisions;
- Appendix A, Basic Services, consisting of 9 pages;
- Appendix B, Certificate(s) of Insurance, consisting of 2 page;
- Appendix C, Schedule of Fees, consisting of 1 pages;

PART I

SPECIAL PROVISIONS

Section 1. Definitions. In this Contract:

- A. "Administrator" means the Engineering Division Director of the Anchorage Water and Wastewater Utility or his designee.
- B. "Anchorage" means the Municipality of Anchorage.
- C. "Contractor" means Merrick & Company.

Section 2. Scope of Services.

- A. The Contractor shall perform aerial Light Detection and Ranging (LIDAR) topographic surveying services in accordance with Appendix A, which is attached hereto and incorporated in this Section by reference.
- B. Anchorage shall not allow any claim for services other than those described in this Section. However, the Contractor may provide, at its own expense, any other services that are consistent with this Contract.
- C. Contractor's services shall be performed in a manner consistent with the care and skill ordinarily exercised by professionals practicing in the same locality and specialty under the same or similar conditions, subject to site conditions and time limits and financial and physical constraints imposed by Anchorage. Contractor makes no warranties or guaranties, either express or implied, of any kind, nature or type whatsoever (including those of condition, merchantability, suitability and fitness for a particular purpose or use) regarding the services. Contractor expressly disclaims all such warranties or guaranties. The foregoing is

collectively referred to as the "Standard of Care."

Section 3. Time for Performance.

- A. This Contract becomes effective when signed on behalf of Anchorage.
- B. The Contractor shall commence performance of the work described in Section 2 on or before May 1, 2015, and complete that performance in accordance with the schedule set forth in Appendix A.
- C. This Contract shall terminate upon the completion of all Work as described and authorized in Appendices A and B or December 31, 2015, whichever occurs earlier.

Section 4. Compensation: Method of Payment.

- A. Subject to the Contractor's satisfactory performance, Anchorage shall pay the Contractor no more than THREE HUNDRED AND FIFTY THOUSAND DOLLARS (\$350,000) in accordance with this Section.
- B. Anchorage shall pay the Contractor in accordance with the schedule of professional fees attached as Appendix C and incorporated herein by reference for services actually performed under this Contract. Anchorage shall pay Contractor within thirty (30) days after receipt of invoice from Contractor.
- C. The Contractor is not entitled to any compensation under this Contract, other than is expressly provided for in this Section.
- D. As a condition of payment, the Contractor shall have paid all municipal taxes currently due and owing by the Contractor.

Section 5. Termination of the Contractor's Services.

The Contractor's services under Section 2 of this Part may be terminated:

- A. By mutual consent of the parties.
- B. For the convenience of Anchorage, provided that Anchorage notifies the Contractor in writing of its intent to terminate under this paragraph at least ten days prior to the effective date of the termination.
- C. For cause, by either party where the other party fails in any Contract for 2015 OrthoTopographic Surveying Services

material way to perform its obligations under this Contract. Termination under this Subsection is subject to the condition that the terminating party notifies the other party of its intent to terminate, stating with reasonable specificity the grounds therefore, and the other party fails to cure the default within 30 days after receiving the notice.

Section 6. Duties Upon Termination.

- A. If Anchorage terminates the Contractor's services for convenience, Anchorage shall pay the Contractor for its actual costs reasonably incurred in performing before termination. Payment under this Subsection shall never exceed the total compensation allowable under Section 4 of this Part. All finished and unfinished documents and materials prepared by the Contractor shall become the property of Anchorage.
- B. If the Contractor's services are terminated for cause, Anchorage shall pay the Contractor the reasonable value of the services satisfactorily rendered prior to termination, less any damages suffered by Anchorage because of the Contractor's failure to perform satisfactorily. The reasonable value of the services rendered shall never exceed the Contract rate for such services, and payment under this Subsection shall not exceed 90 percent of the total compensation allowable under Section 4 of this Part. Any finished or unfinished documents or materials prepared by the Contractor under this Contract shall become the property of Anchorage at its option.
- C. If the Contractor receives payment exceeding the amount to which it is entitled under Subsections A or B of this Section, he shall remit the excess to the Administrator within 30 days of receiving notice to do so.
- D. The Contractor shall not be entitled to any compensation under this Section until the Contractor has delivered to the Administrator all documents, records, Work product, materials and equipment owned by Anchorage and requested by the Administrator.
- E. If the Contractor's services are terminated, for whatever reason, the Contractor shall not claim any compensation under this Contract, other than that allowed under this Section.
- F. If a final audit has not been performed before the Contractor's services are terminated, Anchorage may recover any payments for costs disallowed as a result of the final audit.

- G. Except as provided in this Section, termination of the Contractor's services under Section 5 of this Part does not affect any other right or obligation of a party under this Contract.

Section 7. Insurance.

A. The Contractor shall maintain in good standing, for the entire period of the contact, the insurance described in subsection B of this section. Before rendering any services under this contract, the Contractor shall furnish the Administrator with proof of insurance in accordance with subsection B of this section in a form acceptable to the Risk Manager for Anchorage. Should policy indentified in the followings sections be cancelled the contractor shall notify the MOA Risk Manager upon receipt of such cancellation notice.

- B. The Contractor shall provide the following insurance:
1. \$500,000 Employer's Liability and Worker's Compensation as required by Alaska state statute.
 2. Commercial Automobile Liability per occurrence in the amount of \$500,000 single limit to include owned, hired, and non-owned.
 3. Commercial General Liability in the amount of \$1,000,000 combined single limit to include:
 - i. Premises Operations
 - ii. Products and Completed Operations
 - iii. Blanket Contractual
 - iv. Broad Form Property Damage
 - v. Independent Contractors
 - vi. Personal Injury
 4. As Appropriate – Professional Liability, IT Liability, Errors and Ommissions or Advertising liability in the amount of \$1,000,000 per claim and in the aggregate.

The Commercial “General Liability and Professional Liability /Architects and Engineers Errors and Omissions Liability polices if required, written on a "claims made basis" must have a two (2) year tail of coverage, or an unbroken continuation of coverage for two (2) years, from the completion of the contract requirements.

C. Each policy of insurance required by this section shall provide for advance notice to the MOA/Contract Administrator prior to cancellation in accordance with the policy. IF the insurer does not

notify the MOA upon policy cancellation it shall be the contractors responsibility to notify the MOA of such cancellation.

- D. With the exception of Worker's Compensation and Professional Liability each policy shall name The Municipality as an "Additional/Named insured" and the actual policy endorsement shall accompany each Certificate of Insurance.
- E. General Liability and Automobile policies shall be endorsed to waive all rights of subrogation against the Municipality of Anchorage by reason of any payment made for claims under the above coverage. This policy endorsement should accompany each Certificate of Insurance.

Section 8. Assignments.

Unless otherwise allowed by this Contract or in writing by the Administrator, any assignment by the Contractor of its interest in any part of this Contract or any delegation of duties under this Contract shall be void, and an attempt by the Contractor to assign any part of its interest or delegate duties under this Contract shall give Anchorage the right immediately to terminate this Contract without any liability for Work performed.

Section 9. Ownership, Publication, Reproduction and Use of Material.

- A. Except as otherwise provided herein, all data, documents and materials produced by the Contractor under this Contract shall be the property of Anchorage, which shall retain the exclusive right to publish, disclose, distribute and otherwise use, in whole or in part, any such data, documents, or other materials. Exclusive rights shall not be attributed to portions of such materials presently in the public domain or which are not subject to copyright.
- B. Should Anchorage elect to reuse work products provided under this Contract for other than the original project and/or purpose, Anchorage will not hold Contractor liable for any damages resulting from Anchorage's reuse of work products for an unintended purpose. Additionally, any reuse of design drawings or specifications provided under this Contract must be limited to conceptual or preliminary use for adaptation, and the original Contractor's or subcontractor's signature, professional seals and dates removed. Such reuse of drawings and specifications, which require professional seals and dates removed, will be signed, sealed, and dated by the professional who is in direct supervisory control and responsible for adaptation.

- C. Equipment purchased by the Contractor with designated contract funds shall be the sole property of Anchorage marked and inventoried as such with a copy of the inventory forwarded to Anchorage.

Section 10. Notices.

Any notice required pertaining to the subject matter of this Contract shall be sent via facsimile (FAX) or mailed by prepaid first class registered or certified mail, return receipt requested to the following addresses:

Anchorage: Municipality of Anchorage
Anchorage Water and Wastewater Utility
Kurt Vause, P.E., Engineering Director
3000 Arctic Boulevard
Anchorage, AK 99503-3898
FAX: (907) 562-0824

Contractor: Merrick & Company
Attn: Brian Holzworth, Project Manager
5970 Greenwood Village Plaza
Greenwood Village, CO. 80111
Fax: (303) 745-0964

Notices are effective upon the earlier of receipt, proof of good transmission (facsimiles only), or five days after proof of proper posting.

Section 11. Contract Budget.

In connection with its performance under this Contract, the Contractor shall not make expenditures other than as provided in line items in the Contract budget.

Section 12. Force Majeure.

- A. Any failure to perform by either party due to force majeure shall not be deemed a violation or breach hereof.
- B. As used in this Contract, force majeure is an act or event of substantial magnitude, beyond the control of the delayed party, which delays the completion of this Contract, including without limitation:
 - 1. Any interruption, suspension or interference resulting solely from the act of Anchorage or neglect of Anchorage not otherwise governed by the terms of this Contract.
 - 2. Strikes or work stoppages.

3. Any interruption, suspension or interference with the project caused by acts of God, or acts of a public enemy, wars, blockades, insurrections, riots, arrests or restraints of governments and people, civil disturbances or similar occurrences.

4. Order of court, administrative agencies or governmental officers other than Anchorage.

Section 13. Financial Management System.

The Contractor shall establish and maintain a financial management system that:

- A. Provides accurate, current, and complete disclosure of all financial transactions relating to the Contract;
- B. Maintains separate accounts by source of funds for all revenues and expenditures and identifies the source and application of funds for the Contractor's performance under this Contract, including information pertaining to subcontracts, obligations, unobligated balances, assets, liabilities, outlays and income;
- C. Effectively controls and accounts for all municipal funds and Contract property;
- D. Compares actual expenditures with budgeted amounts and relates financial information to performance or productivity data including unit cost information where applicable;
- E. Allocates administrative costs to direct service delivery units;
- F. Minimizes the time between receipt of funds from Anchorage and their disbursement by the Contractor;
- G. Provides accounting records supported by source documentation; and
- H. Provides a systematic method assuring the timely and appropriate resolution of audit findings and recommendations.

Section 14. Funding Requirements.

In the event that any funding source for this Contract should impose additional requirements upon Anchorage for the use of those funds, the Contractor agrees to abide by those additional requirements immediately

upon receipt of written notice thereof from Anchorage.

Section 15. Subcontracts.

The Contractor may enter into subcontracts for the purchase of goods and services necessary for the performance of this Contract, provided:

- A. Every subcontract shall be reduced to writing and contain a precise description of the services or goods to be provided and the nature of the consideration paid therefore.
- B. Every subcontract under which the Contractor delegates the provision of services shall be subject to review and approval by the Administrator before it is executed by the Contractor.
- C. Every subcontract in an amount exceeding \$2,500 shall require reasonable access to business records of the subcontractor relating to the purchase of goods or services pursuant to the subcontract.

PART II

GENERAL CONTRACT PROVISIONS

Section 1. Relationship of Parties.

The Contractor shall perform its obligations hereunder as an independent Contractor of Anchorage. Anchorage may administer the Contract and monitor the Contractor's compliance with its obligations hereunder. Anchorage shall not supervise or direct the Contractor other than as provided in this Section.

Section 2. Nondiscrimination.

- A. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, national origin, ancestry, age, sex, or marital status or who is a "qualified individual with a disability" (as that phrase is defined in the Americans With Disabilities Act of 1990). The Contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, or mental or physical impairment/disability. Such action shall include, without limitation, employment, upgrading, demotion or transfer, recruitment or recruiting advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training including apprenticeship. The Contractor agrees to post, in conspicuous places available to employees and applicants for employment, notices setting forth the provisions of this non-discrimination clause.
- B. The Contractor shall state, in all solicitations or advertisements for employees to Work on Contract jobs, that all qualified applicants will receive equal consideration for employment without regard to race, color, religion, national origin, ancestry, age, sex or marital status, or mental or physical impairment/disability.
- C. The Contractor shall comply with any and all reporting requirements that may apply to it which the Anchorage Office of Equal Employment Opportunity Contract Compliance may establish by regulation.
- D. The Contractor shall include the provisions of subsections A through C of this section in every subcontract or purchase order under this contract, so as to be binding upon every such subcontractor or vendor of the Contractor under this contract.

The contract compliance officer may accept the contractor's compliance with federal requirements or the contractor's federal reporting documents in lieu of reporting under this section.

- E. The Contractor shall comply with all applicable federal, state, and municipal laws concerning the prohibition of discrimination including, but not limited to, Title 5 and Title 7, Chapter 7.50 of the Anchorage Municipal Code.

Section 3. Permits, Laws, and Taxes.

The Contractor shall acquire and maintain in good standing all permits, licenses and other entitlements necessary to its performance under this Contract. All actions taken by the Contractor under this Contract shall comply with all applicable statutes, ordinances, rules and regulations. The Contractor shall pay all taxes pertaining to its performance under this Contract.

Section 4. Nonwaiver.

The failure of either party at any time to enforce a provision of this Contract shall in no way constitute a waiver of the provision, nor in any way affect the validity of this Contract or any part hereof, or the right of such party thereafter to enforce each and every provision hereof.

Section 5. Amendment.

- A. This Contract shall only be amended, modified or changed by writing, executed by authorized representatives of the parties, with the same formality as this Contract was executed.
- B. For the purposes of any amendment modification or change to the terms and conditions of this Contract, the only authorized representatives of the parties are:

Contractor: Company Officer or Designee

Anchorage: Mayor, Municipal Manager or Authorized Designee

- C. Any attempt to amend, modify, or change this Contract by either an unauthorized representative or unauthorized means shall be void.

Section 6. Jurisdiction; Choice of Law.

Any civil action rising from this Contract shall be brought in the Superior Court for the Third Judicial District of the State of Alaska at Anchorage. The law of the State of Alaska shall govern the rights and obligations of the parties under this Contract.

Section 7. Severability.

Any provision of this Contract decreed invalid by a court of competent jurisdiction shall not invalidate the remaining provisions of the Contract.

Section 8. Integration.

This instrument and all appendices and amendments hereto embody the entire agreement of the parties. There are no promises, terms, conditions or obligations other than those contained herein; and this Contract shall supersede all previous communications, representations or agreements, either oral or written, between the parties hereto.

Section 9. Liability

- A. The Contractor shall indemnify, defend, save and hold Anchorage (or Municipality) harmless from any and all claims, lawsuits or liability, including attorney fees and costs, allegedly arising out of loss, damage or injury to persons or property or from any wrongful or negligent act, error or omission of Contractor, Contractor's agents, employees, subcontractors or invitees, occurring during the course of, or as a result of the Contractor's, Contractor's agents, employees, contractors, subcontractors or invitees performance pursuant to this contract.
- B. The Contractor shall not indemnify, defend, save and hold Anchorage harmless from claims, lawsuits, liability, or attorneys' fees and costs arising from wrongful or negligent acts, error or omission solely of Anchorage occurring during the course of or as a result of the performance of this Contract.
- C. Where claims, lawsuits or liability, including attorneys' fees and costs arise from wrongful or negligent act of both Anchorage and the Contractor, the Contractor shall indemnify, defend, save, and hold Anchorage harmless from only that portion of claims, lawsuits or liability, including attorneys' fees and costs, which result from the Contractor's or any subcontractor's wrongful or negligent acts occurring as a result of the Contractor's performance pursuant to this Contract.

Section 10. Inspection and Retention of Records.

The Contractor shall, at any time during normal business hours and as often as Anchorage may deem necessary, make available to Anchorage, for examination, all of its records with respect to all matters covered by this contract for a period ending three years after the date the Contractor is to complete performance in accordance with Section 2 of the Special Provisions. Upon request, and within a reasonable time, the Contractor shall submit such other information and reports relating to its activities under this contract, to Anchorage, in such form and at such times as Anchorage may reasonably require. The Contractor shall permit Anchorage to audit, examine and make copies of such records, and to make audits of all invoices, materials, payrolls, records of personnel and other data relating to all matters covered by this contract. Anchorage may, at its option, permit the Contractor to submit its records to Anchorage in lieu of the retention requirements of this section.

Section 11. Availability of Funds.

Payments under this contract require funds from future appropriations and are subject to future appropriations. If sufficient funds are not appropriated for payments required under this contract, this contract shall terminate without penalty to Anchorage and Anchorage shall not be obligated to make payments under this contract beyond those which have previously been appropriated.

IN WITNESS WHEREOF, the parties have executed this Contract on the date and at the place shown below.

RECOMMENDED FOR APPROVAL

J. Brett Jokela, P.E.
General Manager, AWWU

Date: _____

MUNICIPALITY OF ANCHORAGE

Merrick & Company

Mayor, Municipal Manager or Authorized Designee

Name: Torin Haskell
Title: Vice-President, Geomatics

Date: _____

DATE: _____

IRS Tax Identification No: 84-0499702
Tax Status: Taxable [X] Non-Taxable []

]

This is to certify that on the _____ day of _____, 2015, before me, the undersigned, a Notary Public in and for the State of Alaska, personally appeared _____, known to me to be the _____ of _____, the corporation named in the foregoing instrument, acknowledged to me that (he/she, in his/her) official capacity, is authorized by the corporation to execute the foregoing instrument as the free act and deed of the said corporation for the uses and purposes therein stated.

WITNESS my hand and official seal the date and year first above written.

NOTARY PUBLIC in and for Alaska

My Commission Expires: _____

Appendix A.
Municipality of Anchorage
LiDAR Topographic Surveying Services
Scope of Work

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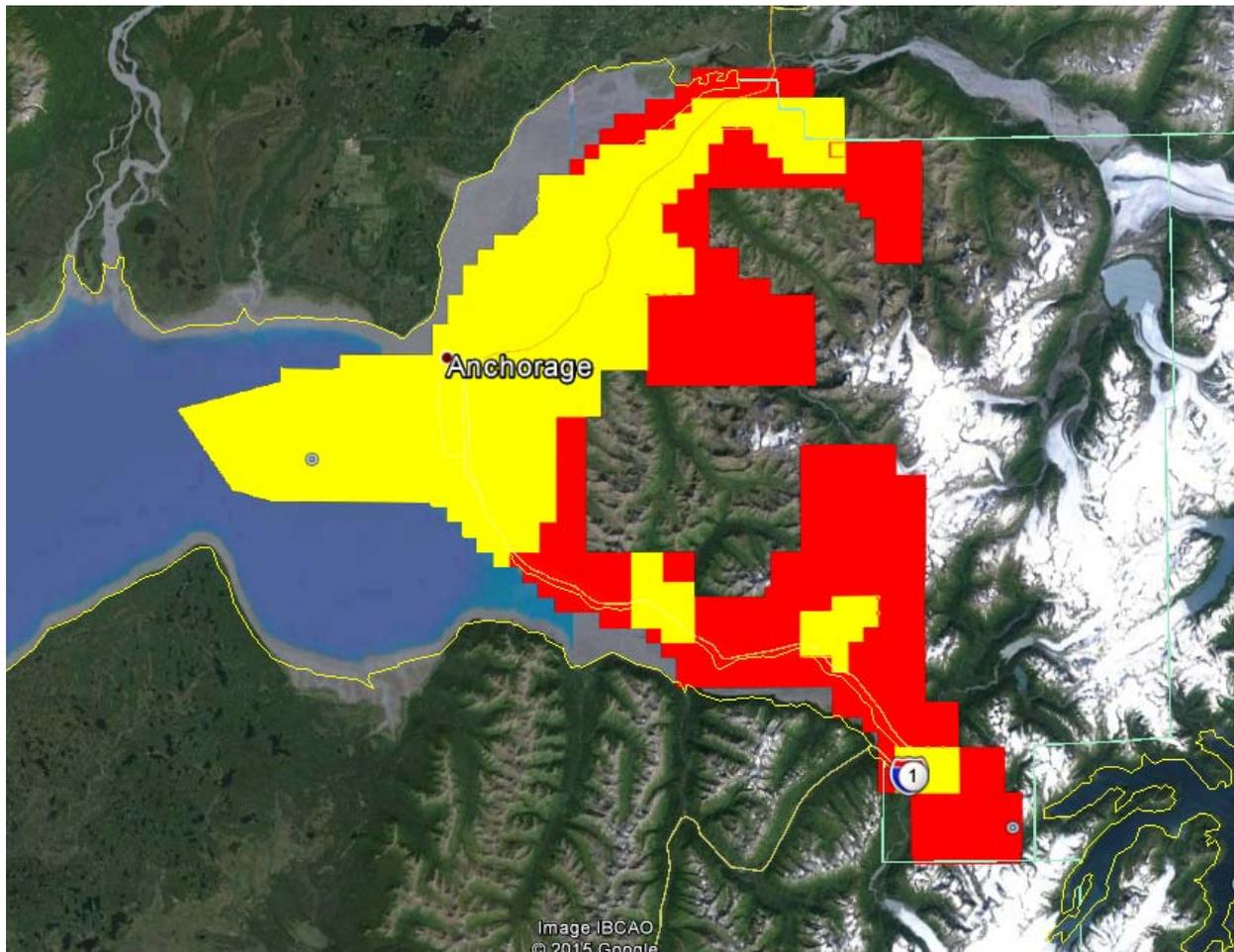
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Project Parameters

The Merrick and Company (Merrick) team will collect a total of 957 square miles which includes collection of Quality Level 2 (QL2) at 2 points per square meter (PPSM) LiDAR for 463 square miles and 494 square miles of 4 PPSM LiDAR. The LiDAR data will meet the USGS LiDAR Base specifications for QL2 data and will be accurate to 9.25 centimeter (cm) vertical to achieve a one foot contour accuracy. The USGS QL2 calls for a 10cm absolute vertical accuracy and the 9.25cm is designed for a one-foot contour solution. This will meet the requirements of USGS LBS specifications. The area of interest (AOI) is located centrally to the Municipality of Anchorage (MOA) and includes the Anchorage Bowl, Fire Island, the northern communities, Turnagain Arm Communities, Gridwood and southward to Portage Valley. Figure 1 below is a graphic detailing the 4 PPSM area in yellow and the QL2 (2PPSM) area in red.

Figure 1. Area of Interest



Collection Conditions

- **Atmospheric:** Cloud, rain, smoke and fog free between aircraft and ground
- **Ground:** Snow free, no unusual flooding or inundation. In some areas of higher elevations, snow may exist year around in the MOA project area. Merrick will closely consult with MOA on the most appropriate ways to mitigate this condition.
- **Tidal Conditions:** Merrick understands that tidal conditions exist in this project area and tides in this area can vary by 30 feet. This is a significant consideration when developing and elevation model. Merrick will monitor the tides and consult with MOA and other agencies to ensure that the collection is completed within the desired tidal window.
- **Vegetation:** Merrick understands that leaf-off conditions are highly preferred. Merrick will work with MOA to ensure that the data is captured under best possible leaf-off conditions with due consideration for a snow free collection as well. It should be noted that sensor parameters can be adapted to optimize collection with a varying degrees of leaf conditions. Typically, the newer sensors (as is with the ALS70) have greatly reduced beam divergence and multi-return information that greatly enhance vegetation “penetration.”
- **Time of Day:** The time of day is not typically a concern for the LiDAR collection. Merrick will consult with MOA regarding the acquisition window and acceptable collection windows whether day or night. However, areas of significant terrain relief can present safety concerns, especially when flying at night. Merrick and PAS maintain the highest standards for flight safety and safety is always our first priority.

Project Tasks

1.0 Project Initiation

A project kick-off meeting will be held between MOA and Merrick to review all technical and administrative aspects of the project.

The specific topics to be addressed include:

- Discuss options for modified / improved products
- Review the proposed flight and ground control scheme and modify, to meet project requirements.
- Review all aspects of the Scope of Work (accuracy requirements, specifications, schedule)
- Discuss communications protocol
- Set reporting schedule as required by MOA; typically, Merrick provides daily reports during acquisition and weekly during production.
- Review Merrick’s and PAS QA/QC procedures
- Define the location of the prototype area
- Discuss/review LiDAR tiling requirements

- Review acceptance criteria for all deliverable products
- Develop Project Status Report requirements
- Demonstrate the functionality of Merrick's Project Portal

2.0 LiDAR Acquisition

Merrick has teamed with Peregrine Aerial Surveys (PAS) for the collection of the LiDAR data. PAS will use their Leica ALS70 LiDAR sensor to acquire the LiDAR data in their Piper PA31 twin engine Navajo.

The following are LiDAR Sensor collection characteristic as they relate to the MOA project and the USGS LBS v1.2 Specifications

- **Collection area:** will be buffered no less than 100 meters
- **Nominal Pulse Spacing(NPS):** QL2 (2PPSM) and 4 PPSM; assessment will be made from single swath, first return data with the useable center portion of the data (typically 90% or greater) of each swath and test as required
- **Signal Returns:** Minimum of 4 returns, greater when available
- **GPS Time:** Adjusted GPS time and per the USGS LBS specification
- **Clustering:** points should be uniform and tested to cell size equal to 2*NPS grid laid over the data. At least 90% of the cells will have at least 1 LIDAR point.
- **Data Voids:** Acceptable data void will occur as a result of water. No data voids should be a result of sensor malfunction or lack of flight line overlap.

Prior to any collection, Merrick and PAS will hold kick internal kick off meeting to review the SOW, requirements, specification and schedule for the acquisition. During the acquisition phase, Merrick will:

- Consult with MOA any factors affecting collection
- Monitor weather and conditions during collection
- Hold technical conference calls and status calls as required
- Manage and report on collection during this project stage

3.0 Processing

Upon completion of the acquisition, PAS will review the LiDAR and ancillary data (GPS, IMU) for coverage and usability. All files will then be transmitted to Merrick where and additional review of the raw data will be completed before any production processing begins.

Merrick Data Processing

1. QC and verify coverage in office and approve
2. Set up project for processing (project data management and control)
3. Receive and review survey information with R&M Consulting

4. Process GPS and IMU data and check for accuracy
5. Lidar data calibration and calibration verification
6. Execute multiple QC routines (MARS® QC) to validate absolute and relative accuracy, point density, data voids, spatial distribution, swath to swath vertical accuracy, intensity values, etc.
7. Set up and test classification macros (identify if specialized macros need to be run locally as a result of unique terrain, man-made and vegetation types)
8. Execute auto-filter macros (automated classifications)
9. QC LIDAR data for completeness and classifications run properly.
10. Manual classification edits
11. QC Lidar data for completeness and vertical accuracy
12. Collect hydro-conditioned/flattened breaklines
13. Generate required products for delivery
14. QC and verify deliverable to ensure compliance with contract requirements
15. Develop reports and documents as required
16. Final pre-delivery QC of data
17. Deliver to MOA

Datum Conversions

This subtask is purposed to ensure that both MOA and USGS receive the data in the correct coordinate and datum systems. The MOA will receive their data in the required Datum and coordinates as specified and USGS will receive their data per the requirements of the USGS Lidar base specification and so that the data can be accepted into the NED or 3DEP data set as required.

Schedule

The following schedule shows a late May start date. Please note, Merrick will begin collection as soon as conditions permit to achieve collection during leaf-off conditions, knowing that weather will play a factor in our schedule. We may be able to move the schedule up. We anticipate acquisition beginning within two weeks of contract signing and Notice to Proceed. The collection phase of the schedule (approximately one month) indicates our estimate of the timeframe to complete the acquisition in light of the above stated factors. The actual duration could be longer or shorter depending on actual weather conditions. We understand that aerial imagery is to be collected in the same timeframe as the LiDAR data.

Task Name	Duration (days)	Start	Finish
Planning and Set up	1	5/22/15	5/22/15
LiDAR collection	45	5/1/15	6/15/15
Collection Verification	41	5/5/15	6/15/15
LiDAR calibration	19	5/21/15	6/10/15
LiDAR Pre-Processing	34	6/10/15	7/14/15
LiDAR Classification	7	7/14/15	7/21/15
LiDAR Edit	40	7/21/15	8/31/15

Breakline Generation	31	8/1/15	9/3/15
Quality Assurance	7	9/3/15	9/10/15
LiDAR deliverables	5	9/10/15	9/15/15
DEM Deliverables	5	9/10/15	9/15/15
Report Generation	5	9/10/15	9/15/15

The provided schedule indicates a completion data September 15th, 2015. The Merrick team will continue to monitor the time lines and work with MOA on any scheduling issues or changes.

Deliverables

The base LiDAR deliverables will conform to USGS LBS specifications V1.2 for Quality Level 2 (QL2) data. The QL2 requires collection of 2 points per square meter (ppsm), nominal LiDAR pulse spacing of no greater than 0.7 meter for 463 square miles and 4 PPSM for 494 sq. miles and a vertical accuracy of better than 10-cm RMSE. (Merrick will provide data to a 9.25cm vertical accuracy in the interest of meeting a 1 foot contour accuracy specification and this will still meet the QL2 specification). The USGS LBS specifications typically requires the following deliverables and it is Merrick’s intent to deliver the following unless otherwise directed by MOA:

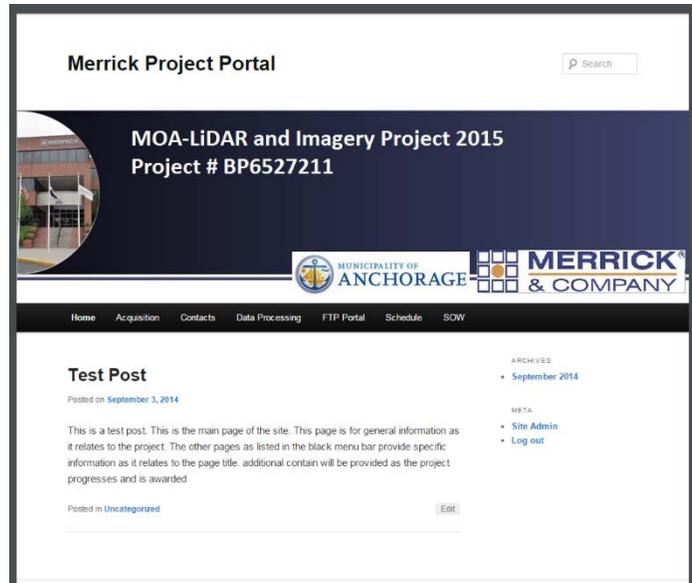
- RAW LAS fully calibrated strips
 - LAS 1.2 [or 1.4] format or as required by MOA
 - Adjusted GPS time
- Fully Classified LAS formatted files - Merrick can modify this classification scheme to support any requirements for MOA, but the below stated is the minimum requirement for USGS LBS Specification:
 - LAS 1.2 [or 1.4] format or as required by MOA
 - Classification of the LiDAR point cloud in accordance with the following classification scheme:
 - Class 1 = Processed, but Unclassified
 - Class 2 = Bare-earth Ground
 - Class 7 = Low point (noise)
 - Class 9 = Water
 - Class 10 = ignored ground (near a Breaklines)
 - Class 17 = Bridges Decks
 - Class 18 = Culverts
- Bare Earth Surface Digital Elevation Models (DEM). USGS typically requires a 32-bit floating point raster in .IMG format and geo-referencing information is included in the raster file, but Merrick will work with MOA to make sure the desired format is provided. Cell size for DEMs will be 1.0 meter and no less than the design NPS unless otherwise requested. The DEM tiles will show no edge artifacts or mismatch. Void areas will be coded using unique “NODATA” value and identified in the file header.

- Hydro Conditioned and Hydro Flattened Breaklines in ESRI Geodatabase or shape file or as required by MOA. This deliverable includes streams and rivers of 30m (100ft) nominal width. Streams or rivers which varying above or below 30 meters will not be broken in multiple segments; best cartographic judgment will be used. Culverts and bridges will conform to the detail in USGS LBS specifications. Water bodies of 8000 square meters (2 acres) or greater surface area at the time of collection will be flattened and all specifications for USGS LBS document will be applied. Tidal water will be will be treated as required by the USGS specification and/or as required by MOA and mutually agreed on.
- LIDAR Campaign Report including non-vegetated vertical accuracy (NVA) and vegetated vertical accuracy (VVA) assessment per the Positional Accuracy Standards for Digital Geospatial Data (ASPRS, 2014) and based on the required number of check points per this Standard. Merrick will work closely with R&M consulting to complete this report.
- The horizontal datum will be NAD83, Alaska State Plane Zone 4; vertical datum will be MOA NGS 1972 Adjustment. Merrick realizes that transforming data to MOA NGS 1972 adjustment is critical to the success of the project. Prior to conducting the collection, Merrick will work with and closely consult with R&M consulting to ensure that we have the necessary reference points and understanding of the transformation parameters.

Project Management

PM Project Portal

Merrick's project methodology includes setting up and maintaining a project portal. The splash screen for the project portal is displayed below. Project information on the portal will include status and reference to all activities stated in the methodology and as displayed in the black menu bar as represented in the figure below. The portal is password protected and login information will be provided to URS and the Center. Notifications of all activities will be automatically relayed to everyone on the project team. Comments from URS and the Center will trigger notification to the Merrick project manager for review and to address if necessary.



Project reporting

Merrick will facilitate MOA in all USGS reporting required by USGS which will include regular scheduled reporting and final Technical report. Merrick and Co. will provide drives with full USGS deliverables on it for review and delivery to USGS. Additional. We will work with MOA to facilitate data acceptance to the USGS per the USGS LBS specification as required by USGS. The following is the detail of reporting that will be followed:

Progress Reports

- a) Monthly progress reports at the first of each month.
- b) The progress reports shall include the following information:
 - i. Scheduled and actual:
 - a. Date the data acquisition contract is in place
 - b. Date that the flying begins
 - c. Date the flying (Lidar acquisition) is scheduled for / is completed
 - d. Date the data is delivered from the acquisition contractor to the organization
 - e. Expected delivery date to the USGS
 - ii. A comparison of actual accomplishments to the objectives of the Agreement established for the budget period and overall progress in response to the performance metrics.
 - iii. The reasons why established goals were not met, if appropriate.
 - iv. Additional pertinent information including, when appropriate, analysis and explanation of cost overruns or high unit costs.
 - v. An outline of anticipated activities and adjustments to the program during the next budget period.
- c) Between the required reporting dates, events may occur which have significant impact upon the project or program. In such cases, the Recipient shall inform the USGS as soon as the following types of conditions become known:
 - (i) Problems, delays, or adverse conditions which will materially impair the ability to meet the objective of the Agreement. This disclosure must include a statement of the action taken, or contemplated, and any assistance needed to resolve the situation.
 - (ii) Favorable developments which enable meeting time schedules and objectives sooner or at less cost than anticipated or producing more or different beneficial results than originally planned.

Final Technical Report

The final technical report shall document and summarize the results of Recipient's work. The report shall include a quantitative description of activities and overall progress in response to the performance metrics which documents and summarizes the results of the entire Agreement. The final report shall include tables, graphs, diagrams, sketches, etc., as required to explain the results

achieved under the Agreement. The report shall also include recommendations and conclusions based upon both the experience and the results obtained.

Final Data Delivery

a) Data Delivery Specifications

Data will adhere to USGS Base Lidar Specifications V1.2 (*Heidemann, Hans Karl, 2014, Lidar base specification (ver. 1.2, November 2014): U.S. Geological Survey Techniques and Methods, book 11, chap. B4, 67 p. with appendixes, <http://dx.doi.org/10.3133/tm11B4>.*)

Pricing

TASK	DESCRIPTION	COST
1--3	Acquisition and processing of QL2 LiDAR data for 957 square miles-USGS Grant Spec	\$320,380
1--3	Acquisition and processing of LiDAR data for 494 square miles, High Density/463 square mile base specifications	\$29,620
TOTAL		\$350,000

Municipality of Anchorage
LIDAR Topographic Surveying Services
Appendix B – Certificate of Insurance

Municipality of Anchorage
LIDAR Topographic Surveying Services

Appendix C – Cost Schedule

LiDAR Project Schedule of Fees						
LiDAR Phase 1		Invoice Date	Invoice Amount			
Aerial Collection (Both Densities)	\$ 175,000					
LiDAR Phase 2		5/29/2015	\$ 17,500			
LiDAR Calibration	\$ 26,255	6/26/2015	\$ 157,500			
LiDAR Classification / Edit	\$ 66,410	7/31/2015	\$ 46,667			
Breakline Compilation	\$ 56,603	8/28/2015	\$ 46,667			
QA / QC	\$ 19,250	9/25/2015	\$ 46,666			
Final Deliverables / Reporting	\$ 6,482	10/30/2015	\$ 35,000	Payable on Deliverable Acceptance		
Total	\$ 350,000		\$ 350,000			